Theory Of Stein Spaces Grundlehren Der Mathematisc

If you ally habit such a referred **theory of stein spaces grundlehren der mathematisc** books that will offer you worth, get the entirely best seller from us currently from several preferred authors. If you want to comical books, lots of novels, tale, jokes, and more fictions collections are then launched, from best seller to one of the most current released.

You may not be perplexed to enjoy every book collections theory of stein spaces grundlehren der mathematisc that we will utterly offer. It is not all but the costs. Its nearly what you craving currently. This theory of stein spaces grundlehren der mathematisc, as one of the most lively sellers here will enormously be along with the best options to review.

Advancements in Complex Analysis Daniel Breaz 2020-05-12 The contributions to this volume are devoted to a discussion of state-of-the-art research and treatment of problems of a wide spectrum of areas in complex analysis ranging from pure to applied and interdisciplinary mathematical research. Topics covered include: holomorphic approximation, hypercomplex analysis, special functions of complex variables, automorphic groups, zeros of the Riemann zeta function, Gaussian multiplicative chaos, non-constant frequency decompositions, minimal kernels, one-component inner functions, power moment problems, complex dynamics, biholomorphic cryptosystems, fermionic and bosonic operators. The book will appeal to graduate students and research mathematicians as well as to physicists, engineers, and scientists, whose work is related to the topics covered.

Hyperbolic Complex Spaces Shoshichi Kobayashi 2013-03-09 In the three decades since the introduction of the Kobayashi distance, the subject of hyperbolic complex spaces and holomorphic mappings has grown to be a big industry. This book gives a comprehensive and systematic account on the Carathéodory and Kobayashi distances, hyperbolic complex spaces and holomorphic mappings with geometric methods. A very complete list of references should be useful for prospective researchers in this area.

Quantum Field Theory and Topology Albert S. Schwarz 2013-04-09 In recent years topology has firmly established itself as an important part of the physicist's mathematical arsenal. It has many applications, first of all in quantum field theory, but increasingly also in other areas of physics. The main focus of this book is on the results of quantum field theory that are obtained by topological methods. Some aspects of the theory of condensed matter are also discussed. Part I is an introduction to quantum field theory: it discusses the basic Lagrangians used in the theory of elementary particles. Part II is devoted to the applications of topology to quantum field theory. Part III covers the necessary mathematical background in summary form. The book is aimed at physicists interested in applications of topology to physics and at mathematicians wishing to familiarize themselves with quantum field theory and the mathematical methods used in this field. It is

accessible to graduate students in physics and mathematics.

Classical Potential Theory and Its Probabilistic Counterpart J. L. Doob 1984-01-30 Potential theory and certain aspects of probability theory are intimately related, perhaps most obviously in that the transition function determining a Markov process can be used to define the Green function of a potential theory. Thus it is possible to define and develop many potential theoretic concepts probabilistically, a procedure potential theorists observe withjaun diced eyes in view of the fact that now as in the past their subject provides the motivation for much of Markov process theory. However that may be it is clear that certain concepts in potential theory correspond closely to concepts in probability theory, specifically to concepts in martingale theory. For example, superharmonic functions correspond to supermartingales. More specifically: the Fatou type boundary limit theorems in potential theory correspond to supermartingale convergence theorems; the limit properties of monotone sequences of superharmonic functions correspond surprisingly closely to limit properties of monotone sequences of super martingales; certain positive superharmonic functions [supermartingales] are called "potentials," have associated measures in their respective theories and are subject to domination principles (inequalities) involving the supports of those measures; in each theory there is a reduction operation whose properties are the same in the two theories and these reductions induce sweeping (balayage) of the measures associated with potentials, and so on.

Several Complex Variables IV Semen G. Gindikin 2012-12-06 This volume of the EMS contains four survey articles on analytic spaces. They are excellent introductions to each respective area. Starting from basic principles in several complex variables each article stretches out to current trends in research. Graduate students and researchers will find a useful addition in the extensive bibliography at the end of each article.

Differential Algebra, Complex Analysis and Orthogonal Polynomials Francisco Marcellán 2010 This volume represents the 2007-2008 Jairo Charris Seminar in Algebra and Analysis on Differential Algebra, Complex Analysis and Orthogonal Polynomials, which was held at the Universidad Sergio Arboleda in Bogota, Colombia. It provides the state of the art in the theory of Integrable Dynamical Systems based on such approaches as Differential Galois Theory and Lie Groups as well as some recent developments in the theory of multivariable and q-orthogonal polynomials, weak Hilbert's 16th Problem, Singularity Theory, Tournaments in flag manifolds, and spaces of bounded analytic functions on the unit circle. The reader will also find survey presentations, an account of recent developments, and the exposition of new trends in the areas of Differential Galois Theory, Integrable Dynamical Systems, Orthogonal Polynomials and Special Functions, and Bloch - Bergman classes of analytic functions from a theoretical and an applied perspective. The contributions present new results and methods, as well as applications and open problems, to foster interest in research in these areas.

Shock Waves and Reaction—Diffusion Equations Joel Smoller 2012-12-06 For this edition, a number of typographical errors and minor slip-ups have been corrected. In addition, following the persistent encouragement of Olga Oleinik, I have added a new chapter, Chapter 25, which I titled "Recent Results." This chapter is divided into four sections, and in these I have discussed what I consider to be some of the important developments which have come about since the writing of the first edition. Section I deals with reaction-

diffusion equations, and in it are described both the work of C. Jones, on the stability of the travelling wave for the Fitz-Hugh-Nagumo equations, and symmetry-breaking bifurcations. Section II deals with some recent results in shock-wave theory. The main topics considered are L. Tartar's notion of compensated compactness, together with its application to pairs of conservation laws, and T.-P. Liu's work on the stability of viscous profiles for shock waves. In the next section, Conley's connection index and connection matrix are described; these general notions are useful in con structing travelling waves for systems of nonlinear equations. The final sec tion, Section IV, is devoted to the very recent results of C. Jones and R. Gardner, whereby they construct a general theory enabling them to locate the point spectrum of a wide class of linear operators which arise in stability problems for travelling waves. Their theory is general enough to be applica ble to many interesting reaction-diffusion systems.

Metric Spaces of Non-Positive Curvature Martin R. Bridson 2013-03-09 A description of the global properties of simply-connected spaces that are non-positively curved in the sense of A. D. Alexandrov, and the structure of groups which act on such spaces by isometries. The theory of these objects is developed in a manner accessible to anyone familiar with the rudiments of topology and group theory: non-trivial theorems are proved by concatenating elementary geometric arguments, and many examples are given. Part I provides an introduction to the geometry of geodesic spaces, while Part II develops the basic theory of spaces with upper curvature bounds. More specialized topics, such as complexes of groups, are covered in Part III.

Complex Geometry and Dynamics John Erik Fornæss 2015-11-05 This book focuses on complex geometry and covers highly active topics centered around geometric problems in several complex variables and complex dynamics, written by some of the world’s leading experts in their respective fields. This book features research and expository contributions from the 2013 Abel Symposium, held at the Norwegian University of Science and Technology Trondheim on July 2-5, 2013. The purpose of the symposium was to present the state of the art on the topics, and to discuss future research directions.

Entropy, Large Deviations, and Statistical Mechanics Richard.S. Ellis 2012-12-06 This book has two main topics: large deviations and equilibrium statistical mechanics. I hope to convince the reader that these topics have many points of contact and that in being treated together, they enrich each other. Entropy, in its various guises, is their common core. The large deviation theory which is developed in this book focuses upon convergence properties of certain stochastic systems. An elementary example is the weak law of large numbers. For each positive e, P{ISn/nl 2: e} con verges to zero as n --+ 00, where Sn is the nth partial sum of indepen dent identically distributed random variables with zero mean. Large deviation theory shows that if the random variables are exponentially bounded, then the probabilities converge to zero exponentially fast as n --+ 00. The exponen tial decay allows one to prove the stronger property of almost sure conver gence (Sn/n --+ 0 a.s.). This example will be generalized extensively in the book. We will treat a large class of stochastic systems which involve both indepen dent and dependent random variables and which have the following features: probabilities converge to zero exponentially fast as the size of the system increases; the exponential decay leads to strong convergence properties of the system. The most fascinating aspect of the theory is that the exponential decay rates are computable in terms of entropy functions. This identification between entropy

and decay rates of large deviation probabilities enhances the theory significantly.

Annales de la faculté des sciences de Toulouse 2006

Cycle Spaces of Flag Domains Gregor Fels 2006-07-30 Driven by numerous examples from the complex geometric viewpoint New results presented for the first time Widely accessible, with all necessary background material provided for the nonspecialist Comparisons with classical Barlet cycle spaces are given Good bibliography and index

Theory of Stein Spaces H. Grauert 2013-03-14 1. The classical theorem of Mittag-Leffler was generalized to the case of several complex variables by Cousin in 1895. In its one variable version this says that, if one prescribes the principal parts of a merom orphic function on a domain in the complex plane e, then there exists a meromorphic function defined on that domain having exactly those principal parts. Cousin and subsequent authors could only prove the analogous theorem in several variables for certain types of domains (e. g. product domains where each factor is a domain in the complex plane). In fact it turned out that this problem can not be solved on an arbitrary domain in em, m ~ 2. The best known example for this is a "notched" bicylinder in 2 2 e . This is obtained by removing the set { (z , z) E e 11 z I ~ !, I z 1 ~ !}, from 1 2 1 2 2 the unit bicylinder, ~ :={(z , z) E e llz1

Affine Space Fibrations Rajendra V. Gurjar 2021-07-05 Affine algebraic geometry has progressed remarkably in the last half a century, and its central topics are affine spaces and affine space fibrations. This authoritative book is aimed at graduate students and researchers alike, and studies the geometry and topology of morphisms of algebraic varieties whose general fibers are isomorphic to the affine space while describing structures of algebraic varieties with such affine space fibrations.

Sphere Packings, Lattices and Groups John H. Conway 2013-04-17 The main themes. This book is mainly concerned with the problem of packing spheres in Euclidean space of dimensions 1,2,3,4,5, ... Given a large number of equal spheres, what is the most efficient (or densest) way to pack them together? We also study several closely related problems: the kissing number problem, which asks how many spheres can be arranged so that they all touch one central sphere of the same size; the covering problem, which asks for the least dense way to cover n-dimensional space with equal overlapping spheres; and the quantizing problem, important for applications to analog-to-digital conversion (or data compression), which asks how to place points in space so that the average second moment of their Voronoi cells is as small as possible. Attacks on these problems usually arrange the spheres so their centers form a lattice. Lattices are described by quadratic forms, and we study the classification of quadratic forms. Most of the book is devoted to these five problems. The miraculous enters: the E 8 and Leech lattices. When we investigate those problems, some fantastic things happen! There are two sphere packings, one in eight dimensions, the E 8 lattice, and one in twenty-four dimensions, the Leech lattice A , which are unexpectedly good and very 24 symmetrical packings, and have a number of remarkable and mysterious properties, not all of which are completely understood even today.

Complex Multiplication S. Lang 2012-12-06 The small book by Shimura-Taniyama on the subject of complex multi is a classic. It gives the results obtained by them (and some by Weil) plication in the higher dimensional case, generalizing in a non-trivial way the method of Deuring for elliptic curves, by reduction mod p. Partly through the work of Shimura himself (cf. [Sh 1] [Sh 2], and [Sh 5]), and some others (Serre, Tate, Kubota, Ribet, Deligne etc.) it is possible today to make a more snappy and extensive presentation of the fundamental results than was possible in 1961. Several persons have found my lecture notes on this subject useful to them, and so I have decided to publish this short book to make them more widely available. Readers acquainted with the standard theory of abelian varieties, and who wish to get rapidly an idea of the fundamental facts of complex multi plication, are advised to look first at the two main theorems, Chapter 3, §6 and Chapter 4, §1, as well as the rest of Chapter 4. The applications of Chapter 6 could also be profitably read early. I am much indebted to N. Schappacher for a careful reading of the manu script resulting in a number of useful suggestions. S. LANG Contents CHAPTER 1 Analytic Complex Multiplication 4 I. Positive Definite Involutions . . . 6 2. CM Types and Subfields. . . . . 8 3. Application to Abelian Manifolds. 4. Construction of Abelian Manifolds with CM 14 21 5. Reflex of a CM Type . . . . .

Metric Rigidity Theorems on Hermitian Locally Symmetric Manifolds Ngaiming Mok 1989-07-01 This monograph studies the problem of characterizing canonical metrics on Hermitian locally symmetric manifolds X of non-compact/compact types in terms of curvature conditions. The proofs of these metric rigidity theorems are applied to the study of holomorphic mappings between manifolds X of the same type. Moreover, a dual version of the generalized Frankel Conjecture on characterizing compact Kähler manifolds are also formulated. Contents:Background and First Results: Historical Background and Summary of ResultsFundamentals of Hermitian and Kähler GeometriesRiemannian and Hermitian Symmetric ManifoldsBounded Symmetric Domains — the Classical CasesBounded Symmetric Domains — General TheoryThe Hermitian Metric Rigidity Theorem for Compact QuotientsThe Kähler Metric Rigidity Theorem in the Semipositive CaseFurther Development: The Hermitian Metric Rigidity Theorem for Quotients of Finite VolumeThe Immersion Problem for Complex Hyperbolic Space FormsThe Hermitian Metric Rigidity Theorem on Locally Homogeneous Holomorphic Vector BundlesA Rigidity Theorem for Holomorphic Mappings between Irreducible Hermitian Symmetric Manifolds of Compact TypeAppendix: Semisimple Lie Algebras and Their RepresentationsSome Theorems in Riemannian GeometryCharacteristic Projective Subvarieties Associated to Hermitian Symmetric ManifoldsA Dual Generalized Frankel Conjecture for Compact Kähler Manifolds of Seminegative Bisectional Curvature Readership: Mathematicians. Keywords:Canonical Metrics;Hermitian Locally Symmetric Spaces;Curvature Conditions;Metric Rigidity Theorems;Holomorphic Maps

Complex Manifolds and Deformation of Complex Structures K. Kodaira 2012-12-06 This book is an introduction to the theory of complex manifolds and their deformations. Deformation of the complex structure of Riemann surfaces is an idea which goes back to Riemann who, in his famous memoir on Abelian functions published in 1857, calculated the number of effective parameters on which the deformation depends. Since the publication of Riemann's memoir, questions concerning the deformation of the complex structure of Riemann surfaces have never lost their interest. The deformation of algebraic surfaces seems to have been considered first by Max Noether in 1888 (M. Noether: Anzahl der Modulen einer Classe algebraischer Fliichen, Sitz. K6niglich.

Preuss. Akad. der Wiss. zu Berlin, erster Halbband, 1888, pp. 123-127). However, the deformation of higher dimensional complex manifolds had been curiously neglected for 100 years. In 1957, exactly 100 years after Riemann's memoir, Frolicher and Nijenhuis published a paper in which they studied deformation of higher dimensional complex manifolds by a differential geometric method and obtained an important result. (A. Fr61icher and A. Nijenhuis: A theorem on stability of complex structures, Proc. Nat. Acad. Sci., U.S.A., 43 (1957), 239-241).

Convex Analysis and Minimization Algorithms II Jean-Baptiste Hiriart-Urruty 1996-10-30 From the reviews: "The account is quite detailed and is written in a manner that will appeal to analysts and numerical practitioners alike...they contain everything from rigorous proofs to tables of numerical calculations.... one of the strong features of these books...that they are designed not for the expert, but for those who whish to learn the subject matter starting from little or no background...there are numerous examples, and counter-examples, to back up the theory...To my knowledge, no other authors have given such a clear geometric account of convex analysis." "This innovative text is well written, copiously illustrated, and accessible to a wide audience"

Theory of Stein Spaces H. Grauert 2012-12-10 1. The classical theorem of Mittag-Leffler was generalized to the case of several complex variables by Cousin in 1895. In its one variable version this says that, if one prescribes the principal parts of a merom orphic function on a domain in the complex plane e, then there exists a meromorphic function defined on that domain having exactly those principal parts. Cousin and subsequent authors could only prove the analogous theorem in several variables for certain types of domains (e. g. product domains where each factor is a domain in the complex plane). In fact it turned out that this problem can not be solved on an arbitrary domain in em, m ~ 2. The best known example for this is a "notched" bicylinder in 2 2 e . This is obtained by removing the set { (z , z) E e 11 z I ~ !, I z 1 ~ !}, from 1 2 1 2 2 the unit bicylinder, ~ :={(z , z) E e llz1

Stein Manifolds and Holomorphic Mappings Franc Forstnerič 2011-08-27 The main theme of this book is the homotopy principle for holomorphic mappings from Stein manifolds to the newly introduced class of Oka manifolds. The book contains the first complete account of Oka-Grauert theory and its modern extensions, initiated by Mikhail Gromov and developed in the last decade by the author and his collaborators. Included is the first systematic presentation of the theory of holomorphic automorphisms of complex Euclidean spaces, a survey on Stein neighborhoods, connections between the geometry of Stein surfaces and Seiberg-Witten theory, and a wide variety of applications ranging from classical to contemporary.

Univalent Functions P. L. Duren 2001-07-02

Real Algebraic Varieties Frédéric Mangolte 2020-09-21 This book gives a systematic presentation of real algebraic varieties. Real algebraic varieties are ubiquitous.They are the first objects encountered when learning of coordinates, then equations, but the systematic study of these objects, however elementary they may be, is formidable. This book is intended for two kinds of audiences: it accompanies the reader, familiar with algebra and geometry at the masters level, in learning the basics of this rich theory, as much as it brings to the most

advanced reader many fundamental results often missing from the available literature, the “folklore”. In particular, the introduction of topological methods of the theory to non-specialists is one of the original features of the book. The first three chapters introduce the basis and classical methods of real and complex algebraic geometry. The last three chapters each focus on one more specific aspect of real algebraic varieties. A panorama of classical knowledge is presented, as well as major developments of the last twenty years in the topology and geometry of varieties of dimension two and three, without forgetting curves, the central subject of Hilbert's famous sixteenth problem. Various levels of exercises are given, and the solutions of many of them are provided at the end of each chapter.

Introduction to Modular Forms Serge Lang 2012-12-06 From the reviews: "This book gives a thorough introduction to several theories that are fundamental to research on modular forms. Most of the material, despite its importance, had previously been unavailable in textbook form. Complete and readable proofs are given... In conclusion, this book is a welcome addition to the literature for the growing number of students and mathematicians in other fields who want to understand the recent developments in the theory of modular forms." #Mathematical Reviews# "This book will certainly be indispensable to all those wishing to get an up-to-date initiation to the theory of modular forms." #Publicationes Mathematicae#

Random Perturbations of Dynamical Systems Mark I. Freidlin 2012-12-06 A treatment of various kinds of limit theorems for stochastic processes defined as a result of random perturbations of dynamical systems. Apart from the long-time behaviour of the perturbed system, exit problems, metastable states, optimal stabilisation, and asymptotics of stationary distributions are considered in detail. The authors'main tools are the large deviation theory, the central limit theorem for stochastic processes, and the averaging principle. The results allow for explicit calculations of the asymptotics of many interesting characteristics of the perturbed system, and most of these results are closely connected with PDEs. This new edition contains expansions on the averaging principle, a new chapter on random perturbations of Hamiltonian systems, along with new results on fast oscillating perturbations of systems with conservation laws. New sections on wave front propagation in semilinear PDEs and on random perturbations of certain infinite-dimensional dynamical systems have been incorporated into the chapter on sharpenings and generalisations.

Abstract Harmonic Analysis Edwin Hewitt 2012-12-06 The book is based on courses given by E. Hewitt at the University of Washington and the University of Uppsala. The book is intended to be readable by students who have had basic graduate courses in real analysis, set-theoretic topology, and algebra. That is, the reader should know elementary set theory, set-theoretic topology, measure theory, and algebra. The book begins with preliminaries in notation and terminology, group theory, and topology. It continues with elements of the theory of topological groups, the integration on locally compact spaces, and invariant functionals. The book concludes with convolutions and group representations, and characters and duality of locally compact Abelian groups.

Geometrical Methods in the Theory of Ordinary Differential Equations V.I. Arnold 2012-12-06 Since the first edition of this book, geometrical methods in the theory of ordinary differential equations have become very

popular and some progress has been made partly with the help of computers. Much of this progress is represented in this revised, expanded edition, including such topics as the Feigenbaum universality of period doubling, the Zoladec solution, the Iljashenko proof, the Ecalle and Voronin theory, the Varchenko and Hovanski theorems, and the Neistadt theory. In the selection of material for this book, the author explains basic ideas and methods applicable to the study of differential equations. Special efforts were made to keep the basic ideas free from excessive technicalities. Thus the most fundamental questions are considered in great detail, while of the more special and difficult parts of the theory have the character of a survey. Consequently, the reader needs only a general mathematical knowledge to easily follow this text. It is directed to mathematicians, as well as all users of the theory of differential equations.

Lectures on Algebraic Geometry I Günter Harder 2011-09-15 This book and the following second volume is an introduction into modern algebraic geometry. In the first volume the methods of homological algebra, theory of sheaves, and sheaf cohomology are developed. These methods are indispensable for modern algebraic geometry, but they are also fundamental for other branches of mathematics and of great interest in their own. In the last chapter of volume I these concepts are applied to the theory of compact Riemann surfaces. In this chapter the author makes clear how influential the ideas of Abel, Riemann and Jacobi were and that many of the modern methods have been anticipated by them. For this second edition the text was completely revised and corrected. The author also added a short section on moduli of elliptic curves with N-level structures. This new paragraph anticipates some of the techniques of volume II.

Topology for Physicists Albert S. Schwarz 2013-03-09 In recent years topology has firmly established itself as an important part of the physicist's mathematical arsenal. Topology has profound relevance to quantum field theory-for example, topological nontrivial solutions of the classical equa tions of motion (solitons and instantons) allow the physicist to leave the frame work of perturbation theory. The significance of topology has increased even further with the development of string theory, which uses very sharp topologi cal methods-both in the study of strings, and in the pursuit of the transition to four-dimensional field theories by means of spontaneous compactification. Im portant applications of topology also occur in other areas of physics: the study of defects in condensed media, of singularities in the excitation spectrum of crystals, of the quantum Hall effect, and so on. Nowadays, a working knowledge of the basic concepts of topology is essential to quantum field theorists; there is no doubt that tomorrow this will also be true for specialists in many other areas of theoretical physics. The amount of topological information used in the physics literature is very large. Most common is homotopy theory. But other subjects also play an important role: homology theory, fibration theory (and characteristic classes in particular), and also branches of mathematics that are not directly a part of topology, but which use topological methods in an essential way: for example, the theory of indices of elliptic operators and the theory of complex manifolds.

Singular Algebraic Curves Gert-Martin Greuel 2018-12-30 Singular algebraic curves have been in the focus of study in algebraic geometry from the very beginning, and till now remain a subject of an active research related to many modern developments in algebraic geometry, symplectic geometry, and tropical geometry. The monograph suggests a unified approach to the geometry of singular algebraic curves on algebraic surfaces

and their families, which applies to arbitrary singularities, allows one to treat all main questions concerning the geometry of equisingular families of curves, and, finally, leads to results which can be viewed as the best possible in a reasonable sense. Various methods of the cohomology vanishing theory as well as the patchworking construction with its modifications will be of a special interest for experts in algebraic geometry and singularity theory. The introductory chapters on zero-dimensional schemes and global deformation theory can well serve as a material for special courses and seminars for graduate and post-graduate students.Geometry in general plays a leading role in modern mathematics, and algebraic geometry is the most advanced area of research in geometry. In turn, algebraic curves for more than one century have been the central subject of algebraic geometry both in fundamental theoretic questions and in applications to other fields of mathematics and mathematical physics. Particularly, the local and global study of singular algebraic curves involves a variety of methods and deep ideas from geometry, analysis, algebra, combinatorics and suggests a number of hard classical and newly appeared problems which inspire further development in this research area.

Equilibrium Capillary Surfaces Robert Finn 2012-12-06 Capillarity phenomena are all about us; anyone who has seen a drop of dew on a plant leaf or the spray from a waterfall has observed them. Apart from their frequently remarked poetic qualities, phenomena of this sort are so familiar as to escape special notice. In this sense the rise of liquid in a narrow tube is a more dramatic event that demands and at first defied explanation; recorded observations of this and similar occur rences can be traced back to times of antiquity, and for lack of expla nation came to be described by words deriving from the Latin word "capillus", meaning hair. It was not until the eighteenth century that an awareness developed that these and many other phenomena are all manifestations of some thing that happens whenever two different materials are situated adjacent to each other and do not mix. If one (at least) of the materials is a fluid, which forms with another fluid (or gas) a free surface interface, then the interface will be referred to as a capillary surface.

Perfect Lattices in Euclidean Spaces Jacques Martinet 2013-03-09 Lattices are discrete subgroups of maximal rank in a Euclidean space. To each such geometrical object, we can attach a canonical sphere packing which, assuming some regularity, has a density. The question of estimating the highest possible density of a sphere packing in a given dimension is a fascinating and difficult problem: the answer is known only up to dimension 3. This book thus discusses a beautiful and central problem in mathematics, which involves geometry, number theory, coding theory and group theory, centering on the study of extreme lattices, i.e. those on which the density attains a local maximum, and on the so-called perfection property. Written by a leader in the field, it is closely related to, though disjoint in content from, the classic book by J.H. Conway and N.J.A. Sloane, Sphere Packings, Lattices and Groups, published in the same series as vol. 290. Every chapter except the first and the last contains numerous exercises. For simplicity those chapters involving heavy computational methods contain only few exercises. It includes appendices on Semi-Simple Algebras and Quaternions and Strongly Perfect Lattices.

Mathematics and Computer Science Daniele Gardy 2012-12-06 This is the first book where mathematics and computer science are directly confronted and joined to tackle intricate problems in computer science with deep mathematical approaches. It contains a collection of refereed papers presented at the Colloquium on

Mathematics and Computer Science held at the University of Versailles-St-Quentin on September 18-20, 2000. The colloquium was a meeting place for researchers in mathematics and computer science and thus an important opportunity to exchange ideas and points of view, and to present new approaches and new results in the common areas such as algorithms analysis, trees, combinatorics, optimization, performance evaluation and probabilities. The book is intended for a large public in applied mathematics, discrete mathematics and computer science, including researchers, teachers, graduate students and engineers. It provides an overview of the current questions in computer science and related modern mathematical methods. The range of applications is very wide and reaches beyond computer science.

Algebraic Complexity Theory Peter Bürgisser 2013-03-14 The algorithmic solution of problems has always been one of the major concerns of mathematics. For a long time such solutions were based on an intuitive notion of algorithm. It is only in this century that metamathematical problems have led to the intensive search for a precise and sufficiently general formalization of the notions of computability and algorithm. In the 1930s, a number of quite different concepts for this purpose were pro posed, such as Turing machines, WHILE-programs, recursive functions, Markov algorithms, and Thue systems. All these concepts turned out to be equivalent, a fact summarized in Church's thesis, which says that the resulting definitions form an adequate formalization of the intuitive notion of computability. This had and continues to have an enormous effect. First of all, with these notions it has been possible to prove that various problems are algorithmically unsolvable. Among of group these undecidable problems are the halting problem, the word problem theory, the Post correspondence problem, and Hilbert's tenth problem. Secondly, concepts like Turing machines and WHILE-programs had a strong influence on the development of the first computers and programming languages. In the era of digital computers, the question of finding efficient solutions to algorithmically solvable problems has become increasingly important. In addition, the fact that some problems can be solved very efficiently, while others seem to defy all attempts to find an efficient solution, has called for a deeper under standing of the intrinsic computational difficulty of problems.

Coherent Analytic Sheaves H. Grauert 2012-12-06 ... Je mehr ich tiber die Principien der Functionentheorie nachdenke - und ich thue dies unablassig -, urn so fester wird meine Uberzeugung, dass diese auf dem Fundamente algebraischer Wahrheiten aufgebaut werden muss (WEIERSTRASS, Glaubensbekenntnis 1875, Math. Werke II, p. 235). 1. Sheaf Theory is a general tool for handling questions which involve local solutions and global patching. "La notion de faisceau s'introduit parce qu'il s'agit de passer de donnees 'locales' a l'etude de proprietes 'globales'" [CAR], p. 622. The methods of sheaf theory are algebraic. The notion of a sheaf was first introduced in 1946 by J. LERAY in a short note Eanneau d'homologie d'une representation, C.R. Acad. Sci. 222, 1366-68. Of course sheaves had occurred implicitly much earlier in mathematics. The "Monogene analytische Functionen", which K. WEIERSTRASS glued together from "Func tionselemente durch analytische Fortsetzung", are simply the connected components of the sheaf of germs of holomorphic functions on a RIEMANN surface*'; and the "ideaux de domaines indetermines", basic in the work of K. OKA since 1948 (cf. [OKA], p. 84, 107), are just sheaves of ideals of germs of holomorphic functions. Highly original contributions to mathematics are usually not appreciated at first. Fortunately H. CARTAN immediately realized the great importance of LERAY'S new abstract concept of a sheaf. In the polycopied notes of his

Semina ire at the E.N.S

Sheaves on Manifolds Masaki Kashiwara 2002-05-01 Sheaf Theory is modern, active field of mathematics at the intersection of algebraic topology, algebraic geometry and partial differential equations. This volume offers a comprehensive and self-contained treatment of Sheaf Theory from the basis up, with emphasis on the microlocal point of view. From the reviews: "Clearly and precisely written, and contains many interesting ideas: it describes a whole, largely new branch of mathematics." –Bulletin of the L.M.S.

Real and Complex Singularities Ana Claudia Nabarro 2016-10-25 This volume is a collection of papers presented at the XIII International Workshop on Real and Complex Singularities, held from July 27–August 8, 2014, in São Carlos, Brazil, in honor of María del Carmen Romero Fuster's 60th birthday. The volume contains the notes from two mini-courses taught during the workshop: on intersection homology by J.-P. Brasselet, and on non-isolated hypersurface singularities and Lê cycles by D. Massey. The remaining contributions are research articles which cover topics from the foundations of singularity theory (including classification theory and invariants) to topology of singular spaces (links of singularities and semi-algebraic sets), as well as applications to topology (cobordism and Lefschetz fibrations), dynamical systems (Morse-Bott functions) and differential geometry (affine geometry, Gauss-maps, caustics, frontals and non-Euclidean geometries). This book is published in cooperation with Real Sociedad Matemática Española (RSME)

Tauberian Theory Jacob Korevaar 2013-03-09 Tauberian theory compares summability methods for series and integrals, helps to decide when there is convergence, and provides asymptotic and remainder estimates. The author shows the development of the theory from the beginning and his expert commentary evokes the excitement surrounding the early results. He shows the fascination of the difficult Hardy-Littlewood theorems and of an unexpected simple proof, and extolls Wiener's breakthrough based on Fourier theory. There are the spectacular "high-indices" theorems and Karamata's "regular variation", which permeates probability theory. The author presents Gelfand's elegant algebraic treatment of Wiener theory and his own distributional approach. There is also a new unified theory for Borel and "circle" methods. The text describes many Tauberian ways to the prime number theorem. A large bibliography and a substantial index round out the book.

Sphere Packings, Lattices and Groups John Conway 2013-06-29 The third edition of this definitive and popular book continues to pursue the question: what is the most efficient way to pack a large number of equal spheres in n-dimensional Euclidean space? The authors also examine such related issues as the kissing number problem, the covering problem, the quantizing problem, and the classification of lattices and quadratic forms. There is also a description of the applications of these questions to other areas of mathematics and science such as number theory, coding theory, group theory, analogue-to-digital conversion and data compression, n-dimensional crystallography, dual theory and superstring theory in physics. New and of special interest is a report on some recent developments in the field, and an updated and enlarged supplementary bibliography with over 800 items.

Gauge Field Theory and Complex Geometry Yuri I. Manin 2013-03-09 From the reviews: "... focused mainly on complex differential geometry and holomorphic bundle theory. This is a powerful book, written by a very distinguished contributor to the field" (Contemporary Physics)"the book provides a large amount of background for current research across a spectrum of field. ... requires effort to read but it is worthwhile and rewarding" (New Zealand Math. Soc. Newsletter) " The contents are highly technical and the pace of the exposition is quite fast. Manin is an outstanding mathematician, and writer as well, perfectly at ease in the most abstract and complex situation. With such a guide the reader will be generously rewarded!" (Physicalia) This new edition includes an Appendix on developments of the last 10 years, by S. Merkulov.