

# Several Complex Variable Volume 7 Encyclopaedia Of Mathematical Sciences

The Enigmatic Realm of **Several Complex Variable Volume 7 Encyclopaedia Of Mathematical Sciences**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing in short supply of extraordinary. Within the captivating pages of **Several Complex Variable Volume 7 Encyclopaedia Of Mathematical Sciences** a literary masterpiece penned with a renowned author, readers set about a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting affect the hearts and minds of people who partake in its reading experience.

*Analysis II* Revaz V. Gamkrelidze 2012-12-06 Intended for a wide range of readers, this book covers the main ideas of convex analysis and approximation theory. The author discusses the sources of these two trends in mathematical analysis, develops the main concepts and results, and mentions some beautiful theorems. The relationship of convex analysis to optimization problems, to the calculus of variations, to optimal control and to geometry is considered, and the evolution of the ideas underlying approximation theory, from its origins to the present day, is discussed. The book is addressed both to students who want to acquaint themselves with these trends and to lecturers in mathematical analysis, optimization and numerical methods, as well as to researchers in these fields who would like to tackle the topic as a whole and seek inspiration for its further development.

*Locally Mixed Symmetric Spaces* Bruce Hunt 2021-09-04 What do the classification of algebraic surfaces, Weyl's dimension formula and maximal orders in central simple algebras have in common? All are related to a type of manifold called locally mixed symmetric spaces in this book. The presentation emphasizes geometric concepts and relations and gives each reader the "roter Faden", starting from the basics and proceeding towards quite advanced topics which lie at the intersection of differential and algebraic geometry, algebra and topology. Avoiding technicalities and assuming only a working knowledge of real Lie groups, the text provides a wealth of examples of symmetric spaces. The last two chapters deal with one particular case (Kuga fiber spaces) and a generalization (elliptic surfaces), both of which require some knowledge of algebraic geometry. Of interest to topologists, differential or algebraic geometers working in areas related to arithmetic groups, the book also offers an introduction to the ideas for non-experts.

*Introduction to Complex Analysis* E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

*Introduction to Complex Analysis* E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

*Period Mappings with Applications to Symplectic Complex Spaces* Tim Kirschner 2015-09-15 Extending Griffiths' classical theory of period mappings for compact Kähler manifolds, this book develops and applies

a theory of period mappings of "Hodge-de Rham type" for families of open complex manifolds. The text consists of three parts. The first part develops the theory. The second part investigates the degeneration behavior of the relative Frölicher spectral sequence associated to a submersive morphism of complex manifolds. The third part applies the preceding material to the study of irreducible symplectic complex spaces. The latter notion generalizes the idea of an irreducible symplectic manifold, dubbed an irreducible hyperkähler manifold in differential geometry, to possibly singular spaces. The three parts of the work are of independent interest, but intertwine nicely.

*Several Complex Variables VII* H. Grauert 2010-10-19 The first survey of its kind, written by internationally known, outstanding experts who developed substantial parts of the field. The book contains an introduction written by Remmert, describing the history of the subject, and is very useful to graduate students and researchers in complex analysis, algebraic geometry and differential geometry.

*Commutative Harmonic Analysis IV* V.P. Khavin 2013-04-17 With the groundwork laid in the first volume (EMS 15) of the *Commutative Harmonic Analysis* subseries of the *Encyclopaedia*, the present volume takes up four advanced topics in the subject: Littlewood-Paley theory for singular integrals, exceptional sets, multiple Fourier series and multiple Fourier integrals.

**Commutative Harmonic Analysis I** V.P. Khavin 2013-03-09 This volume is the first in the series devoted to the commutative harmonic analysis, a fundamental part of the contemporary mathematics. The fundamental nature of this subject, however, has been determined so long ago, that unlike in other volumes of this publication, we have to start with simple notions which have been in constant use in mathematics and physics. Planning the series as a whole, we have assumed that harmonic analysis is based on a small number of axioms, simply and clearly formulated in terms of group theory which illustrate its sources of ideas. However, our subject cannot be completely reduced to those axioms. This part of mathematics is so well developed and has so many different sides to it that no abstract scheme is able to cover its immense concreteness completely. In particular, it relates to an enormous stock of facts accumulated by the classical "trigonometric" harmonic analysis. Moreover, subjected to a general mathematical tendency of integration and diffusion of conventional intersubject borders, harmonic analysis, in its modern form, more and more rests on non-translation invariant constructions. For example, one of the most significant achievements of latter decades, which has substantially changed the whole shape of harmonic analysis, is the penetration in this subject of subtle techniques of singular integral operators.

*Analysis IV* V.G. Maz'ya 2012-12-06 A linear integral equation is an equation of the form  $\int_X k(x, y) \varphi(y) dv(y) = f(x)$ , Here  $(X, \nu)$  is a measure space with a finite measure  $\nu$ ,  $\lambda$  is a complex parameter, and  $a, k, f$  are given (complex-valued) functions, which are referred to as the coefficient, the kernel, and the free term (or the right-hand side) of equation (1), respectively. The problem consists in determining the parameter  $\lambda$  and the unknown function  $\varphi$  such that equation (1) is satisfied for almost all  $x \in X$  (or even for all  $x \in X$  if, for instance, the integral is understood in the sense of Riemann). In the case  $f = 0$ , the equation (1) is called homogeneous, otherwise it is called inhomogeneous. If  $a$  and  $k$  are matrix functions and, accordingly,  $\varphi$  and  $f$  are vector-valued functions, then (1) is referred to as a system of integral equations. Integral equations of the form (1) arise in connection with many boundary value and eigenvalue problems of mathematical physics. Three types of linear integral equations are distinguished: If  $\lambda = 0$ , then (1) is called an equation of the first kind; if  $\lambda a(x) = 0$  for all  $x \in X$ , then (1) is termed an

equation of the second kind; and finally, if a vanishes on some subset of  $X$  but  $2i = 0$ , then (1) is said to be of the third kind.

**Dynamical Systems VIII** V.I. Arnol'd 2013-03-09 This book is devoted to applications of singularity theory in mathematics and physics, covering a broad spectrum of topics and problems. "The book contains a huge amount of information from all the branches of Singularity Theory, presented in a very attractive way, with lots of inspiring pictures." --ZENTRALBLATT MATH

**Hidden Harmony—Geometric Fantasies** Umberto Bottazzini 2013-06-21 This book is a history of complex function theory from its origins to 1914, when the essential features of the modern theory were in place. It is the first history of mathematics devoted to complex function theory, and it draws on a wide range of published and unpublished sources. In addition to an extensive and detailed coverage of the three founders of the subject - Cauchy, Riemann, and Weierstrass - it looks at the contributions of authors from d'Alembert to Hilbert, and Laplace to Weyl. Particular chapters examine the rise and importance of elliptic function theory, differential equations in the complex domain, geometric function theory, and the early years of complex function theory in several variables. Unique emphasis has been devoted to the creation of a textbook tradition in complex analysis by considering some seventy textbooks in nine different languages. The book is not a mere sequence of disembodied results and theories, but offers a comprehensive picture of the broad cultural and social context in which the main actors lived and worked by paying attention to the rise of mathematical schools and of contrasting national traditions. The book is unrivaled for its breadth and depth, both in the core theory and its implications for other fields of mathematics. It documents the motivations for the early ideas and their gradual refinement into a rigorous theory.

Introduction to Complex Analysis E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

**Algebraic Geometry II** I.R. Shafarevich 1995-12-21 This two-part volume contains numerous examples and insights on various topics. The authors have taken pains to present the material rigorously and coherently. This book will be immensely useful to mathematicians and graduate students working in algebraic geometry, arithmetic algebraic geometry, complex analysis and related fields.

*Reversibility in Dynamics and Group Theory* Anthony G. O'Farrell 2015-05-28 An accessible yet systematic account of reversibility that demonstrates its impact throughout many diverse areas of mathematics.

Introduction to Complex Analysis E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

Singularities of integrals Frédéric Pham 2011-04-22 Bringing together two fundamental texts from Frédéric Pham's research on singular integrals, the first part of this book focuses on topological and geometrical aspects while the second explains the analytic approach. Using notions developed by J. Leray in the calculus of residues in several variables and R. Thom's isotopy theorems, Frédéric Pham's foundational study of the singularities of integrals lies at the interface between analysis and algebraic geometry, culminating in the Picard-Lefschetz formulae. These mathematical structures, enriched by the work of Nilsson, are then approached using methods from the theory of differential equations and generalized from

the point of view of hyperfunction theory and microlocal analysis. Providing a 'must-have' introduction to the singularities of integrals, a number of supplementary references also offer a convenient guide to the subjects covered. This book will appeal to both mathematicians and physicists with an interest in the area of singularities of integrals. Frédéric Pham, now retired, was Professor at the University of Nice. He has published several educational and research texts. His recent work concerns semi-classical analysis and resurgent functions.

Introduction to Complex Analysis E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

**Dynamical Systems II** Ya.G. Sinai 2013-11-11 Following the concept of the EMS series this volume sets out to familiarize the reader to the fundamental ideas and results of modern ergodic theory and to its applications to dynamical systems and statistical mechanics. The exposition starts from the basic of the subject, introducing ergodicity, mixing and entropy. Then the ergodic theory of smooth dynamical systems is presented - hyperbolic theory, billiards, one-dimensional systems and the elements of KAM theory. Numerous examples are presented carefully along with the ideas underlying the most important results. The last part of the book deals with the dynamical systems of statistical mechanics, and in particular with various kinetic equations. This book is compulsory reading for all mathematicians working in this field, or wanting to learn about it.

**Several Complex Variables III** G.M. Khenkin 2012-12-06 We consider the basic problems, notions and facts in the theory of entire functions of several variables, i. e. functions  $J(z)$  holomorphic in the entire  $n$  space 1 the zero set of an entire function is not discrete and therefore one has no analogue of a tool such as the canonical Weierstrass product, which is fundamental in the case  $n = 1$ . Second, for  $n > 1$  there exist several different natural ways of exhausting the space

**Partial Differential Equations IV** Yu.V. Egorov 2013-03-09 A two-part monograph covering recent research in an important field, previously scattered in numerous journals, including the latest results in the theory of mixed problems for hyperbolic operators. The book is hence of immense value to graduate students and researchers in partial differential equations and theoretical physics.

*Partial Differential Equations VII* M.A. Shubin 2013-03-09 This EMS volume contains a survey of the principles and advanced techniques of the spectral theory of linear differential and pseudodifferential operators in finite-dimensional spaces. Also including a special section of Sunada's recent solution of Kac's celebrated problem of whether or not "one can hear the shape of a drum".

**Several Complex Variables VII** H. Grauert 2013-03-09 The first survey of its kind, written by internationally known, outstanding experts who developed substantial parts of the field. The book contains an introduction written by Remmert, describing the history of the subject, and is very useful to graduate students and researchers in complex analysis, algebraic geometry and differential geometry.

**Real Methods in Complex and CR Geometry** Marco Abate 2004-08-30 The geometry of real submanifolds in complex manifolds and the analysis of their mappings belong to the most advanced streams of contemporary Mathematics. In this area converge the techniques of various and sophisticated mathematical fields such as P.D.E.s, boundary value problems, induced equations, analytic discs in symplectic spaces, complex dynamics. For the variety of themes and the surprisingly good interplaying of different research tools, these problems attracted the attention of some among the best mathematicians of these latest two decades. They also entered as a refined content of an advanced education. In this sense the five lectures of this volume provide an excellent cultural background while giving very deep insights of current research activity.

Introduction to Complex Analysis E.M. Chirka 1989-12-12 From the reviews: "... In sum, the volume

under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

**Functional Analysis I** Yu.I. Lyubich 2013-03-09 The twentieth-century view of the analysis of functions is dominated by the study of classes of functions. This volume of the Encyclopaedia covers the origins, development and applications of linear functional analysis, explaining along the way how one is led naturally to the modern approach.

**Several Complex Variables V** G.M. Khenkin 2012-12-06 This volume of the Encyclopaedia contains three contributions in the field of complex analysis; on mean periodicity and convolution equations, Yang-Mills fields and the Radon-Penrose transform, and string theory. It is immensely useful to graduate students and researchers in complex analysis, differential geometry, quantum field theory, string theory and general relativity.

**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.

**Algebraic Geometry I** V.I. Danilov 2006-12-15 "... To sum up, this book helps to learn algebraic geometry in a short time, its concrete style is enjoyable for students and reveals the beauty of mathematics." --*Acta Scientiarum Mathematicarum*

**Algebraic Geometry IV** A.N. Parshin 2012-12-06 Two contributions on closely related subjects: the theory of linear algebraic groups and invariant theory, by well-known experts in the fields. The book will be very useful as a reference and research guide to graduate students and researchers in mathematics and theoretical physics.

**Introduction to Complex Analysis** E.M. Chirka 2012-12-06 From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first *Ergebnisse* series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." *Bulletin of the Am.Math.Society*, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." *ZAMP, Zeitschrift für Angewandte Mathematik und Physik*, 1990

**L2 Approaches in Several Complex Variables** Takeo Ohsawa 2015-09-28 The purpose of this monograph is to present the current status of a rapidly developing part of several complex variables, motivated by the applicability of effective results to algebraic geometry and differential geometry. Highlighted are the new precise results on the  $L_2$  extension of holomorphic functions. In Chapter 1, the classical questions of several complex variables motivating the development of this field are reviewed after necessary preparations from the basic notions of those variables and of complex manifolds such as holomorphic functions, pseudoconvexity, differential forms, and cohomology. In Chapter 2, the  $L_2$  method of solving the  $\bar{\partial}$ -equation is presented emphasizing its differential geometric aspect. In Chapter 3, a refinement of the Oka-Cartan theory is given by this method. The  $L_2$  extension theorem with an optimal constant is included, obtained recently by Z. Błocki and by Q.-A. Guan and X.-Y. Zhou separately. In Chapter 4, various results on the Bergman kernel are presented, including recent works of Maitani-Yamaguchi, Berndtsson, and Guan-Zhou. Most of these results are obtained by the  $L_2$  method. In the last chapter, rather specific results are discussed on the existence and classification of certain holomorphic foliations and Levi flat hypersurfaces as their stable sets. These are also applications of the  $L_2$  method obtained during these 15

years.

**Extension of Holomorphic Functions** Marek Jarnicki 2000-01-01 The aim of the series is to present new and important developments in pure and applied mathematics. Well established in the community over two decades, it offers a large library of mathematics including several important classics. The volumes supply thorough and detailed expositions of the methods and ideas essential to the topics in question. In addition, they convey their relationships to other parts of mathematics. The series is addressed to advanced readers wishing to thoroughly study the topic. Editorial Board Lev Birbrair, Universidade Federal do Ceará, Fortaleza, Brasil Victor P. Maslov, Russian Academy of Sciences, Moscow, Russia Walter D. Neumann, Columbia University, New York, USA Markus J. Pflaum, University of Colorado, Boulder, USA Dierk Schleicher, Jacobs University, Bremen, Germany

**Commutative Harmonic Analysis II** Viktor Petrovich Khavin 1998 Classical harmonic analysis is an important part of modern physics and mathematics, comparable in its significance with calculus. Created in the 18th and 19th centuries as a distinct mathematical discipline it continued to develop, conquering new unexpected areas and producing impressive applications to a multitude of problems. It is widely understood that the explanation of this miraculous power stems from group theoretic ideas underlying practically everything in harmonic analysis. This book is an unusual combination of the general and abstract group theoretic approach with a wealth of very concrete topics attractive to everybody interested in mathematics. Mathematical literature on harmonic analysis abounds in books of more or less abstract or concrete kind, but the lucky combination as in this volume can hardly be found.

**Analysis III** S. M. Nikol'skii 2013-03-09 In the Part at hand the authors undertake to give a presentation of the historical development of the theory of imbedding of function spaces, of the internal as well as the external motives which have stimulated it, and of the current state of art in the field, in particular, what regards the methods employed today. The impossibility to cover all the enormous material connected with these questions inevitably forced on us the necessity to restrict ourselves to a limited circle of ideas which are both fundamental and of principal interest. Of course, such a choice had to some extent have a subjective character, being in the first place dictated by the personal interests of the authors. Thus, the Part does not constitute a survey of all contemporary questions in the theory of imbedding of function spaces. Therefore also the bibliographical references given do not pretend to be exhaustive; we only list works mentioned in the text, and a more complete bibliography can be found in appropriate other monographs. O.V. Besov, v.1. Burenkov, P.1. Lizorkin and V.G. Maz'ya have graciously read the Part in manuscript form. All their critical remarks, for which the authors hereby express their sincere thanks, were taken account of in the final editing of the manuscript.

**Real Submanifolds in Complex Space and Their Mappings (PMS-47)** M. Salah Baouendi 2016-06-02 This book presents many of the main developments of the past two decades in the study of real submanifolds in complex space, providing crucial background material for researchers and advanced graduate students. The techniques in this area borrow from real and complex analysis and partial differential equations, as well as from differential, algebraic, and analytical geometry. In turn, these latter areas have been enriched over the years by the study of problems in several complex variables addressed here. The authors, M. Salah Baouendi, Peter Ebenfelt, and Linda Preiss Rothschild, include extensive preliminary material to make the book accessible to nonspecialists. One of the most important topics that the authors address here is the holomorphic extension of functions and mappings that satisfy the tangential Cauchy-Riemann equations on real submanifolds. They present the main results in this area with a novel and self-contained approach. The book also devotes considerable attention to the study of holomorphic mappings between real submanifolds, and proves finite determination of such mappings by their jets under some optimal assumptions. The authors also give a thorough comparison of the various nondegeneracy conditions for manifolds and mappings and present new geometric interpretations of these conditions. Throughout the book, Cauchy-Riemann vector fields and their orbits play a central role and are presented in a setting that is both general and elementary.

**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.

**Dynamical Systems VII** V.I. Arnol'd 2013-12-14 A collection of five surveys on dynamical systems, indispensable for graduate students and researchers in mathematics and theoretical physics. Written in the modern language of differential geometry, the book covers all the new differential geometric and Lie-algebraic methods currently used in the theory of integrable systems.

**Several Complex Variables II** G.M. Khenkin 2012-12-06 Plurisubharmonic functions play a major role in the theory of functions of several complex variables. The extensiveness of plurisubharmonic functions, the simplicity of their definition together with the richness of their properties and, most importantly, their close connection with holomorphic functions have assured plurisubharmonic functions a lasting place in multidimensional complex analysis. (Pluri)subharmonic functions first made their appearance in the works of Hartogs at the beginning of the century. They figure in an essential way, for example, in the proof of the famous theorem of Hartogs (1906) on joint holomorphicity. Defined at first on the complex plane  $\mathbb{C}$ , the class of subharmonic functions became thereafter one of the most fundamental tools in the investigation of analytic functions of one or several variables. The theory of subharmonic functions was developed and generalized in various directions: subharmonic functions in Euclidean space  $\mathbb{R}^n$ , plurisubharmonic functions in complex space  $\mathbb{C}^n$  and others. Subharmonic functions and the foundations of the associated classical potential theory are sufficiently well exposed in the literature, and so we introduce here only a few fundamental results which we require. More detailed expositions can be found in the monographs of Privalov (1937), Brelot (1961), and Landkof (1966). See also Brelot (1972), where a history of the development of the theory of subharmonic functions is given.

**Algebra II** A.I. Kostrikin 2012-12-06 The algebra of square matrices of size  $n \sim 2$  over the field of complex numbers is, evidently, the best-known example of a non-commutative algebra. Subalgebras and subrings of this algebra (for example, the ring of  $n \times n$  matrices with integral entries) arise naturally in many areas of mathematics. Historically however, the study of matrix algebras was preceded by the discovery of quaternions which, introduced in 1843 by Hamilton, found applications in the classical mechanics of the past century. Later it turned out that quaternion analysis had important applications in field theory. The algebra of quaternions has become one of the classical mathematical objects; it is used, for instance, in algebra, geometry and topology. We will briefly focus on other examples of non-commutative rings and algebras which arise naturally in mathematics and in mathematical physics. The exterior algebra (or Grassmann algebra) is widely used in differential geometry - for example, in geometric theory of integration. Clifford algebras, which include exterior algebras as a special case, have applications in representation theory and in algebraic topology. The Weyl algebra (i.e. algebra of differential operators with polynomial coefficients) often appears in the representation theory of Lie algebras. In recent years modules over the Weyl algebra and sheaves of such modules became the foundation of the so-called microlocal analysis. The theory of operator algebras (i.e.

**Multidimensional Integral Representations** Alexander M. Kytmanov 2015-09-09 The monograph is devoted to integral representations for holomorphic functions in several complex variables, such as Bochner-Martinelli, Cauchy-Fantappiè, Koppelman, multidimensional logarithmic residue etc., and their boundary properties. The applications considered are problems of analytic continuation of functions from the boundary of a bounded domain in  $\mathbb{C}^n$ . In contrast to the well-known Hartogs-Bochner theorem, this book investigates functions with the one-dimensional property of holomorphic extension along complex lines, and includes the problems of receiving multidimensional boundary analogs of the Morera theorem. This book is a valuable resource for specialists in complex analysis, theoretical physics, as well as graduate and postgraduate students with an understanding of standard university courses in complex, real and functional analysis, as well as algebra and geometry.

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