Dirac Kets, Gamow Vectors and Gel'fand Triplets - Arno Bohm - 2014-08-23
Dirac's formalism of quantum mechanics was always praised for its elegance. This book introduces the student to its mathematical foundations and demonstrates its ease of applicability to problems in quantum physics. The book starts by describing in detail the concept of Gel'fand triplets and how one can make use of them to make the Dirac heuristic approach rigorous. The results are then deepened by giving the analytic tools, such as the Hardy class function and Hilbert and Mellin transforms, needed in applications to physical problems. Next, the RHS model for decaying states based on the concept of Gamow vectors is presented. Applications are given to physical theories of such phenomena as decaying states and resonances.
Dirac Kets, Gamow Vectors, and Gel'fand Triplets - Arno Böhm - 1969

Geometric Methods in Physics - Piotr Kielanowski - 2014-08-19
The Białowieża Workshops on Geometric Methods in Physics, which are hosted in the unique setting of the Białowieża natural forest in Poland, are among the most important meetings in the field. Every year some 80 to 100 participants from both the mathematics and physics world join to discuss new developments and to exchange ideas. The current volume was produced on the occasion of the 32nd meeting in 2013. It is now becoming a tradition that the Workshop is followed by a School on Geometry and Physics, which consists of advanced lectures for graduate students and young researchers. Selected speakers at the 2013 Workshop were asked to contribute to this book, and their work was supplemented by additional review articles. The selection shows that, despite its now long tradition, the workshop remains at the cutting edge of research. The 2013 Workshop also celebrated the 75th birthday of Daniel Sternheimer, and on this occasion the discussion mainly focused on his contributions to mathematical physics such as deformation quantization, Poisson geometry, symplectic geometry and non-commutative differential geometry.

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Compendium of Quantum Physics - Daniel Greenberger - 2009-07-25
With contributions by leading quantum physicists, philosophers and historians, this comprehensive A-to-Z of quantum physics provides a lucid understanding of key concepts of quantum theory and experiment. It covers technical and interpretational aspects alike, and includes both traditional and new concepts, making it an indispensable resource for concise, up-to-date information about the many facets of quantum physics.

Integrability, Supersymmetry and Coherent States - Şengül Kuru - 2019-07-12
This volume shares and makes accessible new research lines and recent results in several branches of theoretical and mathematical physics, among them Quantum Optics, Coherent States, Integrable Systems, SUSY Quantum Mechanics, and Mathematical Methods in Physics. In addition to a selection of the contributions presented at the "6th International Workshop on New Challenges in Quantum Mechanics: Integrability and Supersymmetry", held in Valladolid, Spain, 27-30 June 2017, several high quality contributions from other authors are also included. The conference gathered 60 participants from many countries working in different fields of Theoretical Physics, and was dedicated to Prof. Véronique Hussin—an internationally recognized expert in many branches of Mathematical Physics who has been making remarkable contributions to this field since the 1980s. The reader will find interesting reviews on the main topics from internationally
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Resonances, Instability, and Irreversibility - Ilya Prigogine - 2009-09-09
In Resonances, Instability, and Irreversibility: The Liouville Space Extension of Quantum Mechanics T. Petrosky and I. Prigogine Unstable Systems in Generalized Quantum Theory E. C. G. Sudarshan, Charles B. Chiu, and G. Bhamathi Resonances and Dilatation Analyticity in Liouville Space Erkki J. Brandas Time, Irreversibility, and Unstable Systems in Quantum Physics E. Eisenberg and L. P. Horwitz Quantum Systems with Diagonal Singularity I. Antoniou and Z. Suchanecki Nonadiabatic Crossing of Decaying Levels V. V. and Vl. V. Kocharovsky and S. Tasaki Can We Observe Microscopic Chaos in the Laboratory? Pierre Gaspard Proton Nonlocality and Decoherence in Condensed Matter -- Predictions and Experimental Results C. A. Chatzidimitriou-Dreismann "We are at a most interesting moment in the history of science. Classical science emphasized equilibrium, stability, and levels of observations. This change of perspective requires new tools, new concepts. This volume invites the reader not to an enumeration of final achievements of contemporary science, but to an excursion to science in the making." --from the Foreword by I. Prigogine What are the dynamical roots of irreversibility? How can past and future be distinguished on the fundamental level of description? Are human beings the children of time --or its progenitors? In recent years, a growing number of chemists and physicists have agreed that the solution to the problem of irreversibility requires an extension of classical and quantum mechanics. There is, however, no consensus on which direction this extension should take to include the dynamical description of irreversible processes. Resonances, Instability, and Irreversibility surveys recent attempts --both direct and indirect --to address the problem of irreversibility. Internationally recognized researchers report on their recent studies, which run the gamut from experimental to highly mathematical. The subject matter of these papers falls into three categories: classical systems with emphasis on chaos and dynamical instability, resonances and unstable quantum systems, and the general problem of irreversibility. Presenting the cutting edge of research into some of the most compelling questions that face contemporary chemical physics, Resonances, Instability, and Irreversibility is fascinating reading for professionals and students in every area of the discipline.
The following main themes were addressed: • Theoretical Aspects of time reversibility. Now we see instabilities, fluctuations, evolution on all levels of observations. This change of perspective requires new tools, new concepts. This volume invites the reader not to an enumeration of final achievements of contemporary science, but to an excursion to science in the making. “...from the Foreword by I. Prigogine

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Irreversible Quantum Dynamics - Fabio Benatti - 2008-01-11

The idea of editing the present volume in the Lecture Notes in Physics series arose while organizing the “Conference on Irreversible Quantum Dynamics” that took place at The Abdus Salam International Center for Theoretical Physics, Trieste, Italy, from July 29 to August 2, 2002. The aim of the Conference was to bring together different groups of researchers whose interests and pursuits involve irreversible quantum systems and time asymmetry in quantum mechanics. The Conference promoted open and in-depth exchanges of different points of view, concerning both the content and character of quantum irreversibility and the methodologies used to study it. The following main themes were addressed: • Theoretical Aspects of Quantum Irreversible Dynamics • Open Quantum Systems and Applications • Foundational Aspects of Irreversible Quantum Dynamics • Asymmetric Time Evolution and Resonances

Each theme was reviewed by an expert in the field, accompanied by more specific, research-like shorter talks. The whole topic of quantum irreversibility in all its manifold aspects has always raised a lot of interest, starting with the description of unstable systems in quantum mechanics and the issue of quantum measurement. Further, in recent years a boost of activity concerning noise, dissipation and open systems has been prompted by the fast developing field of quantum communication and information theory. These considerations motivated the editors to put together a volume that tries to summarize the present day status of the research in the field, with the aim of providing the reader with an accessible and exhaustive introduction to it.

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**Quantum Theory and Symmetries** - Heinz Dietrich Doebner - 2000

This volume gives an overview of the recent representative developments in relativistic and non-relativistic quantum theory, which are related to the application of various mathematical notions of various symmetries. These notions are centered upon groups, algebras and their generalizations, and are applied in interaction with topology, differential geometry, functional analysis and related fields. The emphasis is on results in the following areas: foundation of quantum physics, quantization methods, nonlinear quantum mechanics, algebraic quantum field theory, gauge and string theories, discrete spaces, quantum groups and generalized symmetries.

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**Quantum Theory And Symmetries - Proceedings Of The International Symposium** - Dobrev Vladimir K - 2000-05-05

This volume gives a representative survey of recent developments in relativistic and non-relativistic quantum theory, which are related to the application of symmetries in their most general sense. The corresponding mathematical notions are centered upon groups, algebras and their generalizations, and are applied in interaction with topology, differential geometry, functional analysis and related fields. Special emphasis is on results in the following areas: quantization methods, nonlinear evolution equations, foundation of quantum physics, algebraic quantum field theory, gauge and string theories, quantum information, quantum groups, discrete symmetries.


Symposium on the Foundations of Modern Physics 1993 is the fourth in a series of conferences held in Joensuu, Finland, in the years 1985, 1987 and 1990 and is devoted to offering discussions on foundational problems of quantum mechanics and other fundamental physical theories, taking into account new experimental developments. The surveying of the progress with respect to fundamental questions of the quantum theory of measurement forms the guiding line of thought of the present Symposium, the main themes discussed being: the interrelation of quantum measurement and irreversibility; the physics of information (concerned with questions of information processing and quantum noise); quantum interference and mesoscopic quantum effects (searching for the micro-macro borderline); and the quantum-classical relationship (the need for classical pointer and their realisation).
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A Gift of Prophecy - E C G Sudarshan - 1995-02-22
Robert Eugene Marshak (1916–92) devoted much of his life to helping other people carry out scientific research and gather to discuss their work. In addition to his scientific statesmanship, he was an extraordinarily gifted research scientist, and many of his scientific contributions have been prophetic. This book pays homage to his creativity and continuing work, with contributions from many of the people whose lives have been influenced by him.


Advances in Quantum Chemistry - Erkki J. Brandas - 2004-12-01
Advances in Quantum Chemistry presents surveys of current developments in this rapidly developing field that falls between the historically established areas of mathematics, physics, and chemistry. With invited reviews written by leading international researchers, as well as regular thematic issues, each volume presents new results and provides a single vehicle for following progress in this interdisciplinary area. Volume 47 is a tribute in honor of Professor Osvaldo Goscinski. The volume will look at the accomplishments of a man who has led a remarkable development within the field and developed and strengthened scientific networks in Quantum Chemistry and Chemical Physics. Provides a tribute in honor of Professor
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**Quantum Statistical Mechanics** - William C. Schieve - 2009-04-16
Introduces many-body theory of modern quantum statistical mechanics to graduate students in physics, chemistry, engineering and biology.

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The concept of self-organization is at the heart of the theory of complex systems. It describes how order can emerge from disorder in otherwise chaotic nonlinear dynamical systems. This book investigates and surveys the role of self-organization in a wide variety of disciplines. The contributions are written by world-renowned scientists and philosophers at a level that is accessible to nonspecialists.

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**Emergent Quantum Mechanics** - Jan Walleczek - 2019-04-02
Emergent quantum mechanics explores the possibility of an ontology for quantum mechanics. The resurgence of interest in "deeper-level" theories for quantum phenomena challenges the standard, textbook interpretation. The book presents expert views that critically evaluate the significance—for 21st century physics—of ontological quantum mechanics, an approach that David Bohm helped pioneer. The possibility of a deterministic quantum theory was first introduced with the original de Broglie-Bohm theory, which has also been developed as Bohmian mechanics. The wide range of perspectives that were contributed to this book on the occasion of David Bohm’s centennial celebration provide ample evidence for the physical consistency of ontological quantum mechanics. The book addresses deeper-level questions such as the following: Is reality intrinsically random or fundamentally interconnected? Is the universe local or nonlocal? Might a radically new conception of reality include a form of quantum causality or quantum ontology? What is the role of the experimenter agent? As the book demonstrates, the advancement of ‘quantum ontology’—as a scientific concept—marks a clear break with classical reality. The search for quantum reality entails unconventional causal structures and non-classical ontology, which can be fully consistent with the known record of quantum observations in the laboratory.

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mathematics, physics, chemistry and biology. Features detailed reviews by leading international researchers.

**Quantum Systems in Physics, Chemistry and Biology - Theory, Interpretation and Results** - 2019-01-05

Quantum Systems in Physics, Chemistry and Biology, Theory, Interpretation, and Results, Volume 78, the latest release in the Advances in Quantum Chemistry series presents surveys of current topics in this rapidly developing field that has emerged at the cross section of the historically established areas of mathematics, physics, chemistry and biology. It features detailed reviews written by leading international researchers. Presents surveys of current topics in this rapidly-developing field that has emerged at the cross section of the historically established areas of mathematics, physics, chemistry and biology. Features detailed reviews by leading international researchers.

**Partial Inner Product Spaces** - J-P Antoine - 2009-12-08

Partial Inner Product (PIP) Spaces are ubiquitous, e.g. Rigged Hilbert spaces, chains of Hilbert or Banach spaces (such as the Lebesgue spaces $L_p$ over the real line), etc. In fact, most functional spaces used in (quantum) physics and in signal processing are of this type. The book contains a systematic analysis of PIP spaces and operators defined on them. Numerous examples are described in detail and a large bibliography is provided. Finally, the last chapters cover the many applications of PIP spaces in physics and in signal/image processing, respectively. As such, the book will be useful both for researchers in mathematics and practitioners of these disciplines.

**On Quanta, Mind and Matter** - Harald Atmanspacher - 2012-12-06

INSTEAD OF A "FESTSCHRIFT" In June 1998 Hans Primas turned 70 years old. Although he himself is not fond of jubilees and although he likes to play the decimal system of numbers down as contingent, this is nevertheless a suitable occasion to reflect on the professional work of one of the rare distinguished contemporaries scientists who attach equal importance to experimental and theoretical and conceptual lines of research. Hans Primas' interests have covered an enormous range: methods and instruments for nuclear magnetic resonance, theoretical chemistry, $C^*$ - and $W^*$ -algebraic...
probabilistic foundations of physics. The problems discussed during the various implications, holism and realism in quantum theory, theory reduction, the work and personality of Wolfgang Pauli, as well as Jungian psychology. In many of these fields he provided important and original food for thought, in some cases going far beyond the everyday business in the scientific world. As is the case with other scientists who are conceptually innovative, Hans Primas is read more than he is quoted. His influence is due to his writings. Even with the current flood of publications, he still performs the miracle of having scientists eagerly awaiting his next publication.

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In this volume, leading experts in experimental as well as theoretical physics (both classical and quantum) and probability theory give their views on many intriguing (and still mysterious) problems regarding the probabilistic foundations of physics. The problems discussed during the conference include Einstein-OCoPodolsky-OCoRosen paradox, Bell's inequality, realism, nonlocality, role of Kolmogorov model of probability theory in quantum physics, von Mises frequency theory, quantum information, computation, OC quantum effectsOCO in classical physics.

Contents: Locality and Bell's Inequality (L Accardi & M Regoli); Refutation of Bell's Theorem (G Adenier); Forcing Discretization and Determination in Quantum History Theories (B Coecke); Some Remarks on Hardy Functions Associated with Dirichlet Series (W Ehm); Ensemble Probabilistic Equilibrium and Non-Equilibrium Thermodynamics without the Thermodynamic Limit (D H E Gross); An Approach to Quantum Probability (S Gudder); Innovation Approach to Stochastic Processes and Quantum Dynamics (T Hida); Origin of Quantum Probabilities (A Khrennikov); OC ComplementarityOCO or Schizophrenia: Is Probability in Quantum Mechanics Information or Onta? (A F Kracklauer); A Probabilistic Inequality for the Kochen-OCoSpecker Paradox (J-A Larsson); Quantum Stochastics. The New Approach to the Description of Quantum Measurements (E Loubenets); Is Random Event a Core Question? Some Remarks and a Proposal (P Rocchi); Quantum Cryptography in Space and Bell's Theorem (I Volovich); and other papers. Readership: Graduate students and researchers in quantum physics, mathematical physics, theoretical physics, stochastic processes, and probability & statistics.
realism, nonlocality, role of Kolmogorov model of probability theory in quantum physics, von Mises frequency theory, quantum information, computation, quantum effects? in classical physics.

**Methods in Statistical Mechanics** - Osvaldo Civitarese - 2020-09-07
This book presents a variety of techniques for tackling phenomena that are not amenable to the conventional approach based on the concept of probabilities. The methods described rely on the use of path integration, thermal Green functions, time-temperature propagators, Liouville operators, second quantization, and field correlators at finite density and temperature. Also exploring the statistical mechanics of unstable quantum systems, the book is intended as a supplementary or reference text for use in one-semester graduate courses on Quantum Mechanics, Thermodynamics, Electromagnetism, and Mathematical Methods in Physics.

Symmetry is permeating our understanding of nature: Group theoretical methods of intrinsic interest to mathematics have expanded their applications from physics to chemistry and biology. The ICGTMP Colloquia maintain the communication among the many branches into which this endeavor has bloomed. Lie group and representation theory, special function

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**The Physics of Communication** - Ioannis Antoniou - 2003
This volume presents the state of the art in the research on new possibilities for communication and computation based on quantum theory and nonlocality, as well as related directions and problems. It discusses challenging issues: decoherence and irreversibility; nonlocality and superluminosity; photonics; quantum information and communication; quantum computation.

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**Symmetries in gravity and field theory** - Víctor Aldaya - 2004-01-01

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This book is the second volume of the proceedings of the joint conference X. International Symposium “Quantum Theory and Symmetries” (QTS-X) and XII. International Workshop “Lie Theory and Its Applications in Physics” (LT-XII), 19–25 June 2017, Varna, Bulgaria. The QTS series started around the core concept that symmetries underlie all descriptions of quantum systems. It has since evolved into a symposium on the frontiers of theoretical and mathematical physics. The LT series covers the whole field of Lie Theory in its widest sense together with its applications in many facets of physics. As an interface between mathematics and physics the workshop serves as a meeting place for mathematicians and theoretical and mathematical physicists. In the division of the material between the two volumes, the Editor has tried to select for the first and second volumes papers that are more oriented toward mathematics and physics, respectively. However, this division is relative since many papers could have been placed in either volume. The topics covered in this volume represent the most modern trends in the fields of the joint conferences: symmetries in string theories, conformal field theory, holography, gravity theories and cosmology, gauge theories, foundations of quantum theory, nonrelativistic and classical theories.

**Quantum Physics** - Arno Bohm - 2019-11-06
Leading research, perspectives, and analysis of dynamical systems and presented in its general form by stressing the operator approach. Representations of the algebra of the harmonic oscillator and of the algebra of angular momentum are determined in chapters 1 and 2 respectively. The algebra of angular momentum is enlarged by adding the position operator so that the algebra can be used to describe rigid and non-rigid rotating molecules. The combination of quantum physical systems using direct-product spaces is discussed in chapter 3. The theory is used to describe a vibrating rotator, and the theoretical predictions are then compared with data for a vibrating and rotating diatomic molecule. The formalism of first- and second-order non-degenerate perturbation theory and first-order degenerate perturbation theory are derived in chapter 4. Time development is described in chapter 5 using either the Schrödinger equation of motion or the Heisenberg’s one. An elementary mathematical tutorial forms a useful appendix for the readers who don’t have prior knowledge of the general mathematical structure of quantum mechanics.

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**Dynamical Systems and Irreversibility** - Ioannis Antoniou - 2003-10-17

Leading research, perspectives, and analysis of dynamical systems and irreversibility Edited by Nobel Prize winner Ilya Prigogine and renowned authority Stuart A. Rice, the Advances in Chemical Physics series provides a forum for critical, authoritative evaluations in every area of the discipline. In a format that encourages the expression of individual points of view, experts in the field present comprehensive analyses of subjects of interest. Volume 122 collects papers from the XXI Solvay Conference on Physics, dedicated to the exploration of "Dynamical Systems and Irreversibility." Ioannis Antoniou, Deputy Director of the International Solvay Institutes for Physics and Chemistry, edits and assembles this cutting-edge research, including articles such as "Non-Markovian Effects in the Standard Map," "Harmonic Analysis of Unstable Systems," "Age and Age Fluctuations in an Unstable Quantum System," and discussion of many more subjects. Advances in Chemical Physics remains the premier venue for presentations of new findings in its field.

**Proceedings Of The V Wigner Symposium** - Kasperkovitz Peter - 1998-06-30

The Wigner Symposia deal with the most recent developments in those
also with related fields. The central themes of the proceedings of the 5th Wigner Symposium (WigSym5) are quantum algebras and groups, group-theoretical developments, quantum field theory and geometry, and phase space formulations of quantum mechanics. The proceedings also contain papers on the application of these techniques in various branches of physics, and many contributions in which fundamental mathematical and epistemological questions related to the foundations of quantum theory are discussed.

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Quantum Physics - Roger G. Newton - 2006-04-06
Develops quantum theory from its basic assumptions, beginning with statics, followed by dynamics and details of applications and the needed computational techniques. Most of the book deals with particle systems, as that is where most of the applications lie; the treatment of quantum field theory is confined to fundamental ideas and their consequences.

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Sammlung - Alberto Giovannini - 2000
This important volume describes the wide-ranging scientific activities of Ljon Van Hove, through commentaries by his colleagues and a selection of his most influential papers and documents. The reprinted papers are grouped by topic, starting from his early work in mathematics and theoretical and statistical physics, up to his very last contributions in elementary particle physics and multiparticle dynamics. Van Hove's career as teacher, director and science advisor in many European institutions is presented in sketches by friends and coworkers. A selection of his speeches and documented thoughts on science completes the volume.

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World Congress of Nonlinear Analysts '92 - V. Lakshmikantham - 1996-01-01

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Fundamentals in Hadronic Atom Theory - A Deloff - 2003-04-30
Hadronic atoms provide a unique laboratory for studying hadronic interactions essentially at threshold. This text is the first book-form exposition of hadronic atom theory with emphasis on recent developments, both theoretical and experimental. Since the underlying Hamiltonian is a non-self-adjointed operator, the theory goes beyond traditional quantum mechanics and this book covers topics that are often glossed over in
Keywords: Advanced Quantum Mechanics; Atomic Physics; Elementary Particle Physics. A good knowledge of quantum mechanics and familiarity with nuclear physics are presupposed. Contents: Theoretical Background: Hadronic Atoms — An Overview Extended Quantum Mechanical Framework Coulomb Wave Functions Coulomb Propagator and Scattering Operators Two-Potential Scattering Formalism Bound States and Low-Energy Scattering Atomic Spectrum Gamow States and Completeness Problem X-Ray Transition Rate Computational Methods Examples Chiral Theory Primer Comparison with Experiment: Two-Meson Atomic Bound States Hadronic Hydrogen Hadronic Deuterium Hadronic Atoms with A ≥ 4

Readership: Graduate students and academics in nuclear, atomic, high-energy, computational, quantum and theoretical physics.

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Fundamentals in Hadronic Atom Theory - A Deloff - 2003-04-30
Hadronic atoms provide a unique laboratory for studying hadronic interactions essentially at threshold. This text is the first book-form exposition of hadronic atom theory with emphasis on recent developments, both theoretical and experimental. Since the underlying Hamiltonian is a non-self-adjointed operator, the theory goes beyond traditional quantum mechanics and this book covers topics that are often glossed over in standard texts on nuclear physics. The material contained here is intended for the advanced student and researcher in nuclear, atomic or elementary-particle physics. A good knowledge of quantum mechanics and familiarity with nuclear physics are presupposed. Contents: Theoretical Background: Hadronic Atoms — An Overview Extended Quantum Mechanical Framework Coulomb Wave Functions Coulomb Propagator and Scattering Operators Two-Potential Scattering Formalism Bound States and Low-Energy Scattering Atomic Spectrum Gamow States and Completeness Problem X-Ray Transition Rate Computational Methods Examples Chiral Theory Primer Comparison with Experiment: Two-Meson Atomic Bound States Hadronic Hydrogen Hadronic Deuterium Hadronic Atoms with A ≥ 4

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Symmetries and Groups in Contemporary Physics - Chengming Bai - 2013
This volume focuses on developments in the field of group theory in its broadest sense and is of interest to theoretical and experimental physicists, mathematicians, and scientists in related disciplines who are interested in the latest methods and applications. In an increasingly ultra-specialized world, this volume will demonstrate the interchange of ideas and methods in theoretical and mathematical physics.

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This book presents the up-to-date status of quantum theory and the outlook for its development in the 21st century. The covered topics include basic problems of quantum physics, with emphasis on the foundations of quantum theory, quantum computing and control, quantum optics, coherent states and Wigner functions, as well as on methods of quantum physics based on Lie groups and algebras, quantum groups and noncommutative geometry.

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**Partial *- Algebras and Their Operator Realizations - J-P Antoine - 2002-12-31**
Algebras of bounded operators are familiar, either as C*-algebras or as von Neumann algebras. A first generalization is the notion of algebras of unbounded operators (O*-algebras), mostly developed by the Leipzig school and in Japan (for a review, we refer to the monographs of K. Schmüdgen [1990] and A. Inoue [1998]). This volume goes one step further, by considering systematically partial *-algebras of unbounded operators (partial O*-algebras) and the underlying algebraic structure, namely, partial *-algebras. It is the first textbook on this topic. The first part is devoted to partial O*-algebras, basic properties, examples, topologies on them. The climax is the generalization to this new framework of the celebrated modular theory of Tomita-Takesaki, one of the cornerstones for the applications to statistical physics. The second part focuses on abstract partial *-algebras and their representation theory, obtaining again generalizations of familiar theorems (Radon-Nikodym, Lebesgue).

**Quantum Mechanics Between Ontology and Epistemology - Florian J. Boge - 2018-10-24**
This book explores the prospects of rivaling ontological and epistemic interpretations of quantum mechanics (QM). It concludes with a suggestion for how to interpret QM from an epistemological point of view and with a Kantian touch. It thus refines, extends, and combines existing approaches in a similar direction. The author first looks at current, hotly debated ontological interpretations. These include hidden variables-approaches, Bohmian mechanics, collapse interpretations, and the many worlds interpretation. He demonstrates why none of these ontological interpretations can claim to be the clear winner amongst its rivals. Next, coverage explores the possibility of interpreting QM in terms of knowledge but without the assumption of hidden variables. It examines QBism as well as Healey’s pragmatist view. The author finds both interpretations or programs appealing, but still wanting in certain respects. As a result, he then goes on to advance a genuine proposal as to how to interpret QM from the perspective of an internal realism in the sense of Putnam and Kant. The book also includes two philosophical interludes. One details the notions of probability and realism. The other highlights the connections between the notions of locality, causality, and reality in the context of violations of Bell-type inequalities.
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Nonlinear Dynamics, Chaotic and Complex Systems - E. Infeld - 1997-06-19

The physics and mathematics of nonlinear dynamics, chaotic and complex systems constitute some of the most fascinating developments of late twentieth century science. It turns out that chaotic behaviour can be understood, and even utilized, to a far greater degree than had been suspected. Surprisingly, universal constants have been discovered. The implications have changed our understanding of important phenomena in physics, biology, chemistry, economics, medicine and numerous other fields of human endeavor. In this book, two dozen scientists and mathematicians who were deeply involved in the "nonlinear revolution" cover most of the basic aspects of the field.

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Spacetime Physics Research Trends - Albert Reimer - 2005

Spacetime Physics Research Trends

Structural Aspects Of Quantum Field Theory And Noncommutative Geometry (Second Edition) (In 2 Volumes) - Gerhard Grensing - 2021-07-15

The book is devoted to the subject of quantum field theory. It is divided into two volumes. The first volume can serve as a textbook on main techniques and results of quantum field theory, while the second treats more recent developments, in particular the subject of quantum groups and noncommutative geometry, and their interrelation. The second edition is extended by additional material, mostly concerning the impact of noncommutative geometry on theories beyond the standard model of particle physics, especially the possible role of torsion in the context of the dark matter problem. Furthermore, the text includes a discussion of the Randall-Sundrum model and the Seiberg-Witten equations.

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