OMB No. 3617209025789

# A To Quantum Groups

Quantum Computing Book Recommendations Textbooks for quantum, statistical mechanics and quantum information! Quantum Mechanics - Book Recommendations □□ Quantum groups at roots of unity - Jay Taylor My Quantum Mechanics Textbooks Quantum and Spirituality: Amazing Facts You Didn't Know Roger Penrose: \"String Theory Wrong And Dark Matter Doesn't Exist\" The Quantum Law of Being: Once you understand this, reality shifts. Is string theory still worth exploring? | Roger Penrose and Eric Weinstein battle Brian Greene Roger Penrose on quantum mechanics and consciousness | Full interview The Most Important Science Book Ever Written Roger Penrose About collapse of the wave function Should I go to grad school for quantum computing? Quantum Job Hunting: Everything You Need to Know (And Some Things You Don't) Physicists Proved the Universe Isn’t Real Richard Feynman Learned Basic Calculus With This Book Quantum field theory books | Quantum field theory books for beginners | Quantum field theory Pavel Etingof | Quantum Groups 5 Physics Books You Should Read (Popular Science + Textbook Recommendations) Quantum Book Recommendations Part 2! Absurdly THICK Physics Book Why Quantum Mechanics Is an Inconsistent Theory | Roger Penrose \u0026 Jordan Peterson Symmetries and quantum mechanics: basics, Wigner's theorem, linear representations of groups My First Book of Quantum Physics and Relativity Quantum Group Coaching How to Book a Group Quantum Healing Session Quantum groups at roots of unity - Jay Taylor How Physicists Proved The Universe Isn't Locally Real - Nobel Prize in Physics 2022 EXPLAINED
Integrable Systems, Quantum Groups, and Quantum Field Theories
Algebras of Functions on Quantum Groups: Part I
Quantum Theory, Groups and Representations
Quantum Groups
A Quantum Groups Primer
Lectures on Quantum Groups
Quantum Groups and Their Representations
Introduction to Quantum Groups
Quantum Groups in Two-Dimensional Physics
Quantum Groups and Noncommutative Geometry
Tensor Categories
Hopf Algebras, Quantum Groups and Yang-Baxter Equations
Hopf Algebras and Quantum Groups
Quantum Groups
Algebraic Combinatorics and Quantum Groups
Introduction to Quantum Groups
Quantum Groups
Finite Dimensional Algebras and Quantum Groups
Quantum Groups and Their Primitive Ideals
Elliptic Quantum Groups

*A To Quantum Groups* *OMB No. 3617209025789 edited by*

**BENTON TANIYA**

## Integrable Systems, Quantum Groups, and Quantum Field Theories

Cambridge University Press
Algebra has moved well beyond the topics discussed in standard undergraduate texts on 'modern algebra'. Those books typically dealt with algebraic structures such as groups, rings and fields: still very important concepts! However Quantum Groups: A Path to Current Algebra is written for the reader at ease with at least one such structure and keen to learn algebraic concepts and techniques. A key to understanding these new developments is categorical duality. A quantum group is a vector space with structure. Part of the structure is standard: a multiplication making it an 'algebra'. Another part is not in those standard books at all: a comultiplication, which is dual to multiplication in the precise sense of category theory, making it a 'coalgebra'. While coalgebras, bialgebras and Hopf algebras have been around for half a century, the term 'quantum group', along with revolutionary new examples, was launched by Drinfel'd in 1986.
*Algebras of Functions on Quantum Groups: Part I* Cambridge University Press
This is an introduction to the theory of affine Lie Algebras, to the theory of quantum groups, and to the interrelationships between these two fields that are encountered in conformal field theory.
*Quantum Theory, Groups and Representations* Springer Science & Business Media
The material is very well motivated ... Of the various monographs available on quantum groups, this one ... seems the most suitable for most mathematicians new to the subject ... will also be appreciated by a lot of those with considerably more experience. --Bulletin of the London Mathematical Society Since its origin, the theory of quantum groups has become one of the most fascinating topics of modern mathematics, with numerous applications to several sometimes rather disparate areas, including low-dimensional topology and mathematical physics. This book is one of the first expositions that is specifically directed to students who have no previous knowledge of the subject. The only prerequisite, in addition to standard linear algebra, is some acquaintance with the classical theory of complex semisimple Lie algebras. Starting with the quantum analog of $\mathfrak{sl}_2$, the author carefully leads the reader through all the details necessary for full understanding of the subject, particularly emphasizing similarities and differences with the classical theory. The final chapters of the book describe the Kashiwara-Lusztig theory of so-called crystal (or canonical) bases in representations of complex semisimple Lie algebras. The choice of the topics and the style of exposition make Jantzen's

book an excellent textbook for a one-semester course on quantum groups.

**Quantum Groups** Cambridge University Press

Since its genesis in the early 1980s, the subject of quantum groups has grown rapidly. By the late 1990s most of the foundational issues had been resolved and many of the outstanding problems clearly formulated. To take stock and to discuss the most fruitful directions for future research many of the world's leading figures in this area met at the Durham Symposium on Quantum Groups in the summer of 1999, and this volume provides an excellent overview of the material presented there. It includes important surveys of both cyclotomic Hecke algebras and the dynamical Yang-Baxter equation. Plus contributions which treat the construction and classification of quantum groups or the associated solutions of the quantum Yang-Baxter equation. The representation theory of quantum groups is discussed, as is the function algebra approach to quantum groups, and there is a new look at the origins of quantum groups in the theory of integrable systems.

*A Quantum Groups Primer* CRC Press

The text is devoted to the study of algebras of functions on quantum groups. The book includes the theory of Poisson-Lie algebras (quasi-classical version of algebras of functions on quantum groups), a description of representations of algebras of functions and the theory of quantum Weyl groups. It can serve as a text for an introduction to the theory of quantum groups and is intended for graduate students and research mathematicians working in algebra, representation theory and mathematical physics.

## Lectures on Quantum Groups

Springer Science & Business Media

An introduction to the field of quantum groups, including topology and statistical mechanics, based on lectures given at the Sackler Institute for Advanced Studies at Tel-Aviv University. Detailed proofs of the main results are presented and the bibliography contains more than 1260 references.

**Quantum Groups and Their Representations** Birkhäuser

This book is a printed edition of the Special Issue "Hopf Algebras, Quantum Groups and Yang-Baxter Equations" that was published in Axioms

**Introduction to Quantum Groups** Springer Science & Business Media

The volume starts with a lecture course by P. Etingof on tensor categories (notes by D. Calaque). This course is an introduction to tensor categories, leading to topics of recent research such as realizability of fusion rings, Ocneanu rigidity, module categories, weak Hopf algebras, Morita theory for tensor categories, lifting theory, categorical dimensions, Frobenius-Perron dimensions, and the classification of tensor categories. The remainder of the book consists of three detailed expositions on associators and the Vassiliev invariants of knots, classical and quantum integrable systems and elliptic algebras, and the groups of algebra automorphisms of quantum groups. The preface puts the results presented in perspective. Directed at research mathematicians and theoretical physicists as well as graduate students, the volume gives an overview of the ongoing research in the domain of quantum groups, an important subject of current mathematical physics.

Quantum Groups in Two-Dimensional Physics European Mathematical Society

This book provides a self-contained introduction to quantum groups as algebraic objects. Based on the author's lecture notes for the Part III pure mathematics course at Cambridge University, it is suitable for use as a textbook for graduate courses in quantum groups or as supplement to modern courses in advanced algebra. The book assumes a background knowledge of basic algebra and linear algebra. Some familiarity with semisimple Lie algebras would also be helpful. The book is aimed as a primer for mathematicians but will also be useful for mathematical physicists.

**Quantum Groups and Noncommutative Geometry** Springer Nature

Quantum GroupsSpringer Science & Business Media

## Tensor Categories

American Mathematical Soc.

This book provides an introduction to the theory of quantum groups with emphasis on their duality and on the setting of operator algebras. Part I of the text presents the basic theory of Hopf algebras, Van Daele's duality theory of algebraic quantum groups, and Woronowicz's compact quantum groups, staying in a purely algebraic setting. Part II focuses on quantum groups in the setting of operator algebras. Woronowicz's compact quantum groups are treated in the setting of $C^*$-algebras, and the fundamental multiplicative unitaries of Baaj and Skandalis are studied in detail. An outline of Kustermans' and Vaes' comprehensive theory of locally compact quantum groups completes this part. Part III leads to selected topics, such as coactions, Baaj-Skandalis-duality, and approaches to quantum groupoids in the setting of operator algebras. The book is addressed to graduate students and non-experts from other fields. Only basic knowledge of (multi-) linear algebra is required for the first part, while the second and third part assume some familiarity with Hilbert spaces, $C^*$-algebras, and von Neumann algebras.

**Hopf Algebras, Quantum Groups and Yang-Baxter Equations** Springer Science & Business Media

This textbook presents the second edition of Manin's celebrated 1988 Montreal lectures, which influenced a new generation of researchers in algebra to take up the study of Hopf algebras and quantum groups. In this expanded write-up of those lectures, Manin systematically develops an approach to quantum groups as symmetry objects in noncommutative geometry in contrast to the more deformation-oriented approach due to Faddeev, Drinfeld, and others. This new edition contains an extra chapter by Theo Raedschelders and Michel Van den Bergh, surveying recent work that focuses on the representation theory of a number of bi- and Hopf algebras that were first introduced in Manin's lectures, and have since gained a lot of attention. Emphasis is placed on the Tannaka–Krein formalism, which further strengthens Manin's approach to symmetry and moduli-objects in noncommutative geometry.

*Hopf Algebras and Quantum Groups* European Mathematical Society

Algebraic combinatorics has evolved into one of the most active areas of mathematics. Its developments have become more interactive with not only its traditional field representation theory but also geometry, mathematical physics and harmonic analysis. This book presents articles from some of the key contributors in the area. It covers Hecke algebras, Hall algebras, the Macdonald polynomial and its deviations, and their relations with other fields.

## Quantum Groups

MDPI

This book start with an introduction to quantum groups for the beginner and continues as a textbook for graduate students in physics and in mathematics. It can also be used as a reference by more advanced readers. The authors cover a large but well-

chosen variety of subjects from the theory of quantum groups (quantized universal enveloping algebras, quantized algebras of functions) and q-deformed algebras (q-oscillator algebras), their representations and corepresentations, and noncommutative differential calculus. The book is written with potential applications in physics and mathematics in mind. The basic quantum groups and quantum algebras and their representations are given in detail and accompanied by explicit formulas. A number of topics and results from the more advanced general theory are developed and discussed.

**Algebraic Combinatorics and Quantum Groups** Springer

With applications in quantum field theory, general relativity and elementary particle physics, this three-volume work studies the invariance of differential operators under Lie algebras, quantum groups and superalgebras. This second volume covers quantum groups in their two main manifestations: quantum algebras and matrix quantum groups. The exposition covers both the general aspects of these and a great variety of concrete explicitly presented examples. The invariant q-difference operators are introduced mainly using representations of quantum algebras on their dual matrix quantum groups as carrier spaces. This is the first book that covers the title matter applied to quantum groups. Contents Quantum Groups and Quantum Algebras Highest-Weight Modules over Quantum Algebras Positive-Energy Representations of Noncompact Quantum Algebras Duality for Quantum Groups Invariant q-Difference Operators Invariant q-Difference Operators Related to GLq(n) q-Maxwell Equations Hierarchies

*Introduction to Quantum Groups* American Mathematical Soc.

"The interplay between finite dimensional algebras and Lie theory dates back many years. In more recent times, these interrelations have become even more strikingly apparent. This text combines, for the first time in book form, the theories of finite dimensional algebras and quantum groups. More precisely, it investigates the Ringel-Hall algebra realization for the positive part of a quantum enveloping algebra associated with a symmetrizable Cartan matrix and it looks closely at the Beilinson-Lusztig-MacPherson realization for the entire quantum $\mathfrak{gl}_n$. The book begins with the two realizations of generalized Cartan matrices, namely, the graph realization and the root datum realization. From there, it develops the representation theory of quivers with automorphisms and the theory of quantum enveloping algebras associated with Kac-Moody Lie algebras. These two independent theories eventually meet in Part 4, under the umbrella of Ringel-Hall algebras. Cartan matrices can also be used to define an important class of groups--Coxeter groups--and their associated Hecke algebras. Hecke algebras associated with symmetric groups give rise to an interesting class of quasi-hereditary algebras, the quantum Schur algebras. The structure of these finite dimensional algebras is used in Part 5 to build the entire quantum $\mathfrak{gl}_n$ through a completion process of a limit algebra (the Beilinson-Lusztig-MacPherson algebra). The book is suitable for advanced graduate students. Each chapter concludes with a series of exercises, ranging from the routine to sketches of proofs of recent results from the current literature."--Publisher's website.

Quantum Groups American Mathematical Soc.

Invited articles by top notch experts Focus is on topics in representation theory of algebraic groups and quantum groups Of interest to graduate students and researchers in representation theory, group theory, algebraic geometry, quantum theory and math physics

**Finite Dimensional Algebras and Quantum Groups** World Scientific

This book is a collection of papers dedicated to Richard E. Block, whose research has been largely devoted to the study of Lie algebras of prime characteristic (specifically the classification of simple Lie algebras). The volume presents proceedings of a conference held at the University of California at Riverside in February 1994 on the occasion of his retirement. The conference focused on the interplay between the theory of Lie algebras of prime characteristic, quantum groups, and Lie superalgebras. Titles in this series are co-published with International Press, Cambridge, MA, USA.

## Quantum Groups and Their Primitive Ideals

Springer Nature

Since they first arose in the 1970s and early 1980s, quantum groups have proved to be of great interest to mathematicians and theoretical physicists. The theory of quantum groups is now well established as a fascinating chapter of representation theory, and has thrown new light on many different topics, notably low-dimensional topology and conformal field theory. The goal of this book is to give a comprehensive view of quantum groups and their applications. The authors build on a self-contained account of the foundations of the subject and go on to treat the more advanced aspects concisely and with detailed references to the literature. Thus this book can serve both as an introduction for the newcomer, and as a guide for the more experienced reader. All who have an interest in the subject will welcome this unique treatment of quantum groups.

*Elliptic Quantum Groups* Quantum Groups

This volume is based on the proceedings of the Hopf-Algebras and Quantum Groups conference at the Free University of Brussels, Belgium. It presents state-of-the-art papers - selected from over 65 participants representing nearly 20 countries and more than 45 lectures - on the theory of Hopf algebras, including multiplier Hopf algebras and quantum g