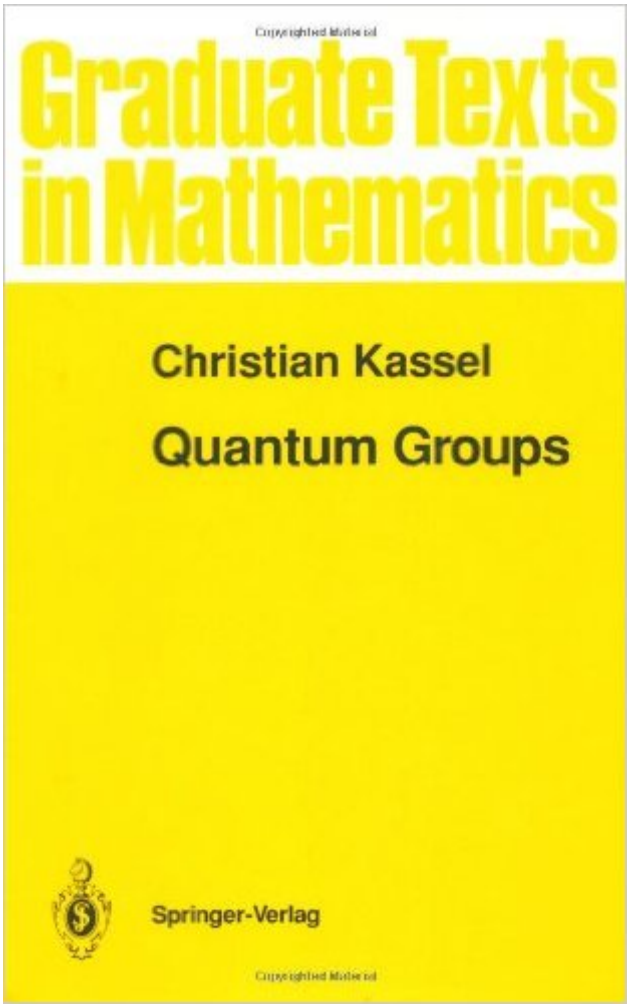
Quantum Groups (Graduate Texts In Mathematics)



Synopsis

Here is an introduction to the theory of quantum groups with emphasis on the spectacular connections with knot theory and Drinfeld's recent fundamental contributions. It presents the quantum groups attached to SL2 as well as the basic concepts of the theory of Hopf algebras. Coverage also focuses on Hopf algebras that produce solutions of the Yang-Baxter equation and provides an account of Drinfeld's elegant treatment of the monodromy of the Knizhnik-Zamolodchikov equations.

Book Information

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Customer Reviews

This book is further evidence of the tremendous influence that quantum physics, especially quantum field theory and superstring theory, has had on modern mathematics. Very rich mathematical structures and simplified methods of proof have resulted from looking at mathematics from a quantum point of view. Because of the enormous success of viewpoint, examples being proofs of the Atiyah-Singer index theorem, the Jones polynomial, and the Seiberg-Witten equations, one could justify a rephrasing of the remark by Eugene Wigner and now speak of "the reasonable effectiveness of physics in mathematics". The book gives a fine overview of a field that has only been around for a few decades, and is manifested by brilliant developments. Those who have worked with the Yang-Baxter equations from the theory of exactly solved models in statistical mechanics will see these equations come alive here in a much more general form. In addition, knot

theorists and geometric topologists will appreciate the discussion of how their constructions can be cast in the tensor and tangle categories that are explained in detail in this book. The title of the book is a little strange, given that the structures treated are more specific than groups, but the author has explained well the theory of quantum groups, as is it is now referrred to in journal classification schemes. An in-depth reading of the book is time-consuming, and no doubt the average reader will not read it from cover to cover but instead will peruse only the areas of immediate interest. Part One of the book is an overview of what the author calls quantum SL(2), which is an example of a Hopf algebra.