

1. Record Nr.	UNINA9910698648803321
Autore	Kashaev Rinat
Titolo	A course on Hopf algebras // Rinat Kashaev
Pubbl/distr/stampa	Cham, Switzerland : , : Springer Nature Switzerland AG, , [2023] ©2023
ISBN	9783031263064 9783031263057
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (173 pages)
Collana	Universitext, , 2191-6675
Disciplina	512.55
Soggetti	Hopf algebras Àlgebres de Hopf Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Sommario/riassunto	This textbook provides a concise, visual introduction to Hopf algebras and their application to knot theory, most notably the construction of solutions of the Yang–Baxter equations. Starting with a reformulation of the definition of a group in terms of structural maps as motivation for the definition of a Hopf algebra, the book introduces the related algebraic notions: algebras, coalgebras, bialgebras, convolution algebras, modules, comodules. Next, Drinfel'd's quantum double construction is achieved through the important notion of the restricted (or finite) dual of a Hopf algebra, which allows one to work purely algebraically, without completions. As a result, in applications to knot theory, to any Hopf algebra with invertible antipode one can associate a universal invariant of long knots. These constructions are elucidated in detailed analyses of a few examples of Hopf algebras. The presentation of the material is mostly based on multilinear algebra, with all definitions carefully formulated and proofs self-contained. The general theory is illustrated with concrete examples, and many technicalities are handled with the help of visual aids, namely string diagrams. As a result, most of this text is accessible with minimal prerequisites and can serve as the basis of introductory courses to beginning graduate

students.
