

1. Record Nr.	UNINA9911137530503321
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Titolo	Quantum invariants of knots and 3-manifolds // Vladimir G. Turaev
Pubbl/distr/stampa	Berlin, : De Gruyter, 2010
ISBN	9786612716034 9781282716032 1282716034 9783110221848 3110221845
Edizione	[2nd rev. ed.]
Descrizione fisica	1 online resource (604 p.)
Collana	De Gruyter studies in mathematics, , 0179-0986 ; ; 18
Classificazione	SK 320
Disciplina	514.2242 514.34
Soggetti	Quantum field theory Knot theory Three-manifolds (Topology) Invariants
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. [571]-588) and index.
Nota di contenuto	pt. 1. Towards topological field theory -- pt. 2. The shadow world -- pt. 3. Towards modular categories.
Sommario/riassunto	Due to the strong appeal and wide use of this monograph, it is now available in its second revised edition. The monograph gives a systematic treatment of 3-dimensional topological quantum field theories (TQFTs) based on the work of the author with N. Reshetikhin and O. Viro. This subject was inspired by the discovery of the Jones polynomial of knots and the Witten-Chern-Simons field theory. On the algebraic side, the study of 3-dimensional TQFTs has been influenced by the theory of braided categories and the theory of quantum groups. The book is divided into three parts. Part I presents a construction of 3-dimensional TQFTs and 2-dimensional modular functors from so-called modular categories. This gives a vast class of knot invariants and 3-manifold invariants as well as a class of linear representations of the mapping class groups of surfaces. In Part II the technique of 6j-

symbols is used to define state sum invariants of 3-manifolds. Their relation to the TQFTs constructed in Part I is established via the theory of shadows. Part III provides constructions of modular categories, based on quantum groups and skein modules of tangles in the 3-space. This fundamental contribution to topological quantum field theory is accessible to graduate students in mathematics and physics with knowledge of basic algebra and topology. It is an indispensable source for everyone who wishes to enter the forefront of this fascinating area at the borderline of mathematics and physics. From the contents: Invariants of graphs in Euclidean 3-space and of closed 3-manifolds Foundations of topological quantum field theory Three-dimensional topological quantum field theory Two-dimensional modular functors 6j-symbols Simplicial state sums on 3-manifolds Shadows of manifolds and state sums on shadows Constructions of modular categories
