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Autore	Przytycki Józef H
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Altri autori (Persone)	BakshiRhea Palak IbarraDionne Montoya-VegaGabriel WeeksDeborah
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Nota di contenuto	1. History of Knot Theory From Ancient Times to Gauss and His Student Listing -- 2. History of Knot Theory From Gauss to Jones -- 3. FROM FOX 3-COLORING TO THE YANG-BAXTER OPERATOR -- 4. Lecture ?: Goeritz and Seifert Matrices -- 5. Chapter Heading -- 6. The HOMFLYPT and the 2-variable Kauffman Polynomial -- 7. Lecture 8: The Temperley - Lieb Algebra and Braid Groups -- 8. Lecture 9: Symmetrizers of Finite Groups and Jones-Wenzl Idempotents -- 9. Lecture 10: Plucking polynomial of rooted trees and its use in knot theory -- 10. Lecture 11: Basics of Skein Modules -- 11. Lecture 12: The Kauffman Bracket Skein Module -- 12. Lecture 13: The Kauffman Bracket Skein Module and Algebra of Surface I-bundles -- 13. Lecture 14: Multiplicative Structure of the Kauffman Bracket Skein Algebra of

	the Thickened T-Shirt -- 14. Spin Structure and the Framing Skein Module of Links in 3-Manifolds -- 15. Lecture 16: The Witten - Reshetikhin - Turaev Invariant of 3-manifolds -- 16. Lecture 19: Type A Gram determinant.-17. Lecture 18: Gram Determinants of Type B and Type M b -- 18. Lecture 19: Khovanov homology: a categorification of The Jones polynomial -- 19. Lecture 20: Long Exact Sequence of Khovanov Homology and Torsion -- 20. Lecture 21: Categorification of Skein Modules of Twisted I-bundles over surfaces -- Appendix A: Basics of 3-Dimensional Topology. -Appendix B: Surgery on Links in the 3-Sphere and Kirby's Calculus. -Glossary -- SOlutions.
Sommario/riassunto	This text is based on lectures delivered by the first author on various, often nonstandard, parts of knot theory and related subjects. By exploring contemporary topics in knot theory including those that have become mainstream, such as skein modules, Khovanov homology and Gram determinants motivated by knots, this book offers an innovative extension to the existing literature. Each lecture begins with a historical overview of a topic and gives motivation for the development of that subject. Understanding of most of the material in the book requires only a basic knowledge of topology and abstract algebra. The intended audience is beginning and advanced graduate students, advanced undergraduate students, and researchers interested in knot theory and its relations with other disciplines within mathematics, physics, biology, and chemistry. Inclusion of many exercises, open problems, and conjectures enables the reader to enhance their understanding of the subject. The use of this text for the classroom is versatile and depends on the course level and choices made by the instructor. Suggestions for variations in course coverage are included in the Preface. The lecture style and array of topical coverage are hoped to inspire independent research and applications of the methods described in the book to other disciplines of science. An introduction to the topology of 3-dimensional manifolds is included in Appendices A and B. Lastly, Appendix C includes a Table of Knots.