Knots: Mathematics with a Twist

Alexei Sossinsky
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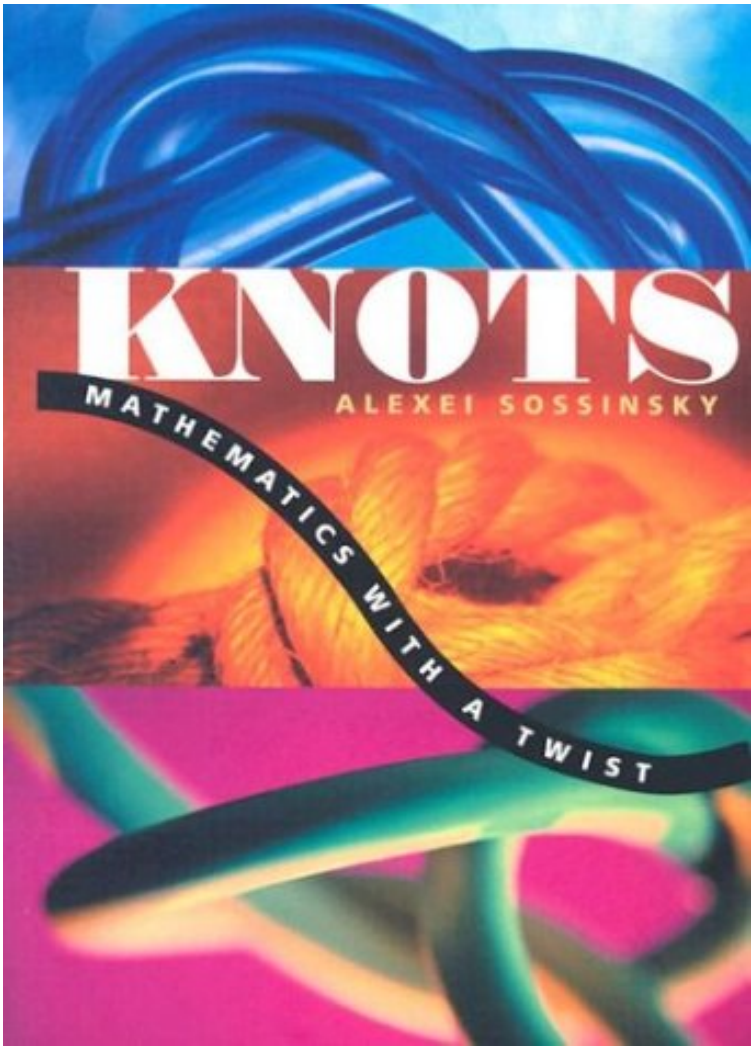

#3593175 in Books Harvard University Press 2004-04-15 2004-03-08Original language:FrenchPDF # 1 6.92 x .51 x 5.12l, .36 #File Name: 0674013816160 pages | File size: 19.Mb

Alexei Sossinsky : Knots: Mathematics with a Twist before purchasing it in order to gage whether or not it would be worth my time, and all praised Knots: Mathematics with a Twist:

5 of 6 people found the following review helpful. A Fun BookBy Michael GraberIf you like mathematics, even if you did not major in math, read this book. It is written for both the non-mathematician and the Ph.D. mathematician. For a more rigorous introduction, see Prasolov and Sossinsky, Knots, Links, Braids and 3-Manifolds.25 of 28 people found the following review helpful. This book is bad!By Frank NasserDon't buy this book if you're a mathematician!Either something really disturbing has happened during one of the translations (russian-french-english), or I seriously doubt mr. Sossinsky's ability to teach anyone about knot theory.Almost every single calculation in the book is wrong. Some of the errors are plain typo's, admitted. But others are so disturbingly wrong that I had to read the passages several

times to believe that a mathematician could have written this.One notable example is when the author calculates (correctly for once) the Conway polynomial of the trefoil knot to be 1+x^2. Then goes on (this is so good, I just have to quote it):"A calculation similar to this one shows that the Conway polynomial for the figure eight knot (Figure 1.2) is equal to x^2+1: it is the same as that for the trefoil. The Conway polynomial does not distinguish the trefoil from the figure eight knot; it is not refined enough for that."In fact, the figure eight knot has Conway polynomial 1-x^2. Scary that an expert on knot theory can make this error (three times in a row!). -Afterall, the simplest counterexample to whether the Conway polynomial is a perfect invariant is a very, very basic thing to know!Other mistakes are rather amusing (even whilst still being annoying). For instance, the author confuses a figure-eight knot with an unknot, shortly after casually mentioning that his intuition of space is "fairly well developed".Another thing that annoys me as a mathematician is the author's "personal digressions", trying to explain how the minds of mathematicians work and why mathematics can be beautiful in the same way as arts and music. The worst one of them is concerned with how the author *almost* discovered the Kaufmann construction of the Jones Polynomial before Kaufmann did. (At least, that's how it sounds to me.) In my opinion, either you try to explain some math, or you do pocket philosophy. -Not both at once!On the good side, the actual subjects treated in the book are very well chosen. (Except, the author promises twice to get back to telling about the Alexander polynomial but he never does...) (And that last thing reminds me: The book has no index!!!)So, my advise is: read the contents pages and go learn the theory from elsewhere.17 of 21 people found the following review helpful. Read the Adams book insteadBy A CustomerIf you just plan to skim the text and do not intend to try applying the ideas presented to actual knots, then you may not notice this small book's many errors. But if you wish to verify what the text says and try your hand at some knot calculations, then this is not the book for you. Perhaps the worst example is the author's comment that the figure-eight knot and the trefoil not have the same Conway polynomial. They don't. After an hour of calculating and recalculating, it is frustrating to discover that the author, not the reader, is the one in error. That kind of elementary error makes one question the author's basic competence and knowledge of the field.Another error is made when giving an example of calculating the Conway polynomial for a link with two separate circles (page 68): the right-hand side of the equation should have no term in x. Figure 2.15 (algebraic representation of a braid) also has an error: the upper-right-hand braid elementary braid is b2, not b1. (The text below the diagram is correct, but the diagram itself has it wrong.)For a beginner who is learning the subject, the necessity of sorting out the author's errors is unacceptable. A book with so many errors should have an errata (list of corrections) on the web, but I searched and found none.I though the braid chapter was well-written. I have not studied braids before and it made the situation pretty clear.On the plus side, the drawings are excellent, the best I have seen in any knot book. For example, figure 3.3 (page 40) has a nice diagram clearly showing various "problems" that might happen momentarily during Reidemeister moves. In this case, a picture is worth a thousand words.I did not enjoy the author's mini-digressions into non-mathematical applications of knots. They went on too long and didn't relate well to the mathematics in the book.Finally, this author seems to have a bit of an attitude. He makes it sound like he almost beat Kaufmann to discovering Kaufmann's bracket. Then he goes on to point out that the Celtic people discovered a form of it centuries ago (beating Kaufmann). Sounds like sour grapes to me. He makes frequent comments such as "the attentive reader will notice," which I found annoying after a while. Readers do not like to be insulted.After a full day with this book, I am tossing it into the trash. The Knot Book by Colin Adams is solid on the math and a better overall introduction to the math side.

Ornaments and icons, symbols of complexity or evil, aesthetically appealing and endlessly useful in everyday ways, knots are also the object of mathematical theory, used to unravel ideas about the topological nature of space. In recent years knot theory has been brought to bear on the study of equations describing weather systems, mathematical models used in physics, and even, with the realization that DNA sometimes is knotted, molecular biology. This book, written by a mathematician known for his own work on knot theory, is a clear, concise, and engaging introduction to this complicated subject. A guide to the basic ideas and applications of knot theory, Knots takes us from Lord Kelvin's early--and mistaken--idea of using the knot to model the atom, almost a century and a half ago, to the central problem confronting knot theorists today: distinguishing among various knots, classifying them, and finding a straightforward and general way of determining whether two knots--treated as mathematical objects--are equal.Communicating the excitement of recent ferment in the field, as well as the joys and frustrations of his own work, Alexei Sossinsky reveals how analogy, speculation, coincidence, mistakes, hard work, aesthetics, and intuition figure far more than plain logic or magical inspiration in the process of discovery. His spirited, timely, and lavishly illustrated work shows us the pleasure of mathematics for its own sake as well as the surprising usefulness of its connections to real-world problems in the sciences. It will instruct and delight the expert, the amateur, and the curious alike.

[A] thought-provoking analysis of why technology has failed to live up to its promises. (Daniel Goroff, Professor of the Practice of Mathematics, Harvard University)In her provocative new book, Victoria Nelson contends that modern civilization has repressed our spiritual instincts. (Clifford Pickover, author of The Zen of Magic Squares, Circles, and Stars)Nelson skillfully manages to thrust the sphere of academic research headlong into popular culture, making this

both accessible and erudite... (Ian Stewart, author of Flatterland and What Shape is a Snowflake?)Indeed, knots are trendy and also accessible to recreational mathematicians. A sophisticated high school student might enjoy working out the math in this book, while a full-fledged math student would find it a charming tour of knot theory's greatest hits...An enjoyable math book and highly recommended. (Amy Crunvard Library Journal 2003-02-01)The author describes knot theory by chronicling its history. Beginning with Lord Kelvin's ill-conceived idea of using knots as a model for the atom, Sossinsky moves to the connection of knots to braids and then on to the arithmetic of knots. Other topics are the Jones polynomial, which links knot theory to physics, and a clear exposition on Vassilev invariants. Throughout, this book untangles many a snag in the field of mathematics. (Science News 2003-01-11)In a charming and spirited discussion of classical and contemporary knot theory, Sossinsky, beginning with Lord Kelvin's (c. 1860) theory of knots as models for atoms...moves through discussions of braids, links, Reidemeister moves, surgery, various knot polynomials (Alexander-Conway, Homfly, Jones), Vassiliev invariants, and concludes with connections between and speculations about knots and physics. (S. J. Colley Choice 2003-09-01)This eminently likeable introduction to knot theory is heavily illustrated with diagrams to help us get our heads around the mind-bending ideas, and Sossinsky delights in breaking off at tangents to relate surprising knot-related facts of the natural world, such as the fish that ties its body in a knot to escape predators, or the topological operations that are performed by an enzyme on DNA. (The Guardian 2004-07-31) [A] thought-provoking analysis of why technology has failed to live up to its promises. --Daniel Goroff, Professor of the Practice of Mathematics, Harvard UniversityAbout the AuthorAlexei Sossinsky is Professor of Mathematics, University of Moscow.