

1. Record Nr.	UNINA9910480842003321
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Titolo	Classical Topology and Combinatorial Group Theory [[electronic resource] /] / by John Stillwell
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1993
ISBN	1-4612-4372-6
Edizione	[2nd ed. 1993.]
Descrizione fisica	1 online resource (XII, 336 p.)
Collana	Graduate Texts in Mathematics, , 0072-5285 ; ; 72
Disciplina	514 514/.2
Soggetti	Topology Topological groups Lie groups Topological Groups, Lie Groups
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
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Coverings -- 7.3 Braids -- 8 Three-Dimensional Manifolds -- 8.1 Open Problems in Three-Dimensional Topology -- 8.2 Polyhedral Schemata -- 8.3 Heegaard Splittings -- 8.4 Surgery -- 8.5 Branched Coverings -- 9 Unsolvable Problems -- 9.1 Computation -- 9.2 HNN Extensions -- 9.3 Unsolvable Problems in Group Theory -- 9.4 The Homeomorphism Problem -- Bibliography and Chronology.

Sommario/riassunto

In recent years, many students have been introduced to topology in high school mathematics. Having met the Mobius band, the seven bridges of Königsberg, Euler's polyhedron formula, and knots, the student is led to expect that these picturesque ideas will come to full flower in university topology courses. What a disappointment "undergraduate topology" proves to be! In most institutions it is either a service course for analysts, on abstract spaces, or else an introduction to homological algebra in which the only geometric activity is the completion of commutative diagrams. Pictures are kept to a minimum, and at the end the student still does not understand the simplest topological facts, such as the reason why knots exist. In my opinion, a well-balanced introduction to topology should stress its intuitive geometric aspect, while admitting the legitimate interest that analysts and algebraists have in the subject. At any rate, this is the aim of the present book. In support of this view, I have followed the historical development where practicable, since it clearly shows the influence of geometric thought at all stages. This is not to claim that topology received its main impetus from geometric recreations like the seven bridges; rather, it resulted from the visualization of problems from other parts of mathematics—complex analysis (Riemann), mechanics (Poincaré), and group theory (Dehn). It is these connections to other parts of mathematics which make topology an important as well as a beautiful subject.
