Título: Graphs Of Groups On Surfaces Interactions And Models

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Sinopsis

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The book, suitable as both an introductory reference and as a text book in the rapidly growing field of topological graph theory, models both maps (as in map-coloring problems) and groups by means of graph imbeddings on sufaces. Automorphism groups of both graphs and maps are studied. In addition connections are made to other areas of mathematics, such as hypergraphs, block designs, finite geometries, and finite fields. There are chapters on the emerging subfields of enumerative topological graph theory and random topological graph theory, as well as a chapter on the composition of English church-bell music. The latter is facilitated by imbedding the right graph of the right group on an appropriate surface, with suitable symmetries. Throughout the emphasis is on Cayley maps: imbeddings of Cayley graphs for finite groups as (possibly branched) covering projections of surface imbeddings of loop graphs with one vertex. This is not as restrictive as it might sound; many developments in topological graph theory involve such imbeddings.

The approach aims to make all this interconnected material readily accessible to a beginning graduate (or an advanced undergraduate) student, while at the same time providing the research mathematician with a useful reference book in topological graph theory. The focus will be on beautiful connections, both elementary and deep, within mathematics that can best be described by the intuitively pleasing device of imbedding graphs of groups on surfaces.