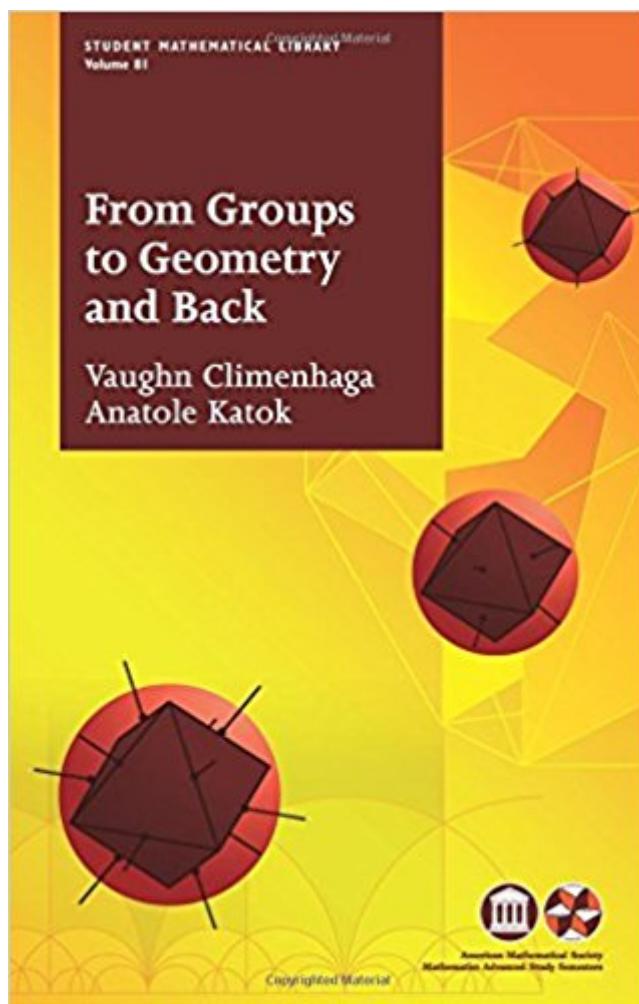


The book was found

# From Groups To Geometry And Back (Student Mathematical Library)



## Synopsis

Groups arise naturally as symmetries of geometric objects, and so groups can be used to understand geometry and topology. Conversely, one can study abstract groups by using geometric techniques and ultimately by treating groups themselves as geometric objects. This book explores these connections between group theory and geometry, introducing some of the main ideas of transformation groups, algebraic topology, and geometric group theory. The first half of the book introduces basic notions of group theory and studies symmetry groups in various geometries, including Euclidean, projective, and hyperbolic. The classification of Euclidean isometries leads to results on regular polyhedra and polytopes; the study of symmetry groups using matrices leads to Lie groups and Lie algebras. The second half of the book explores ideas from algebraic topology and geometric group theory. The fundamental group appears as yet another group associated to a geometric object and turns out to be a symmetry group using covering spaces and deck transformations. In the other direction, Cayley graphs, planar models, and fundamental domains appear as geometric objects associated to groups. The final chapter discusses groups themselves as geometric objects, including a gentle introduction to Gromov's theorem on polynomial growth and Grigorchuk's example of intermediate growth. The book is accessible to undergraduate students (and anyone else) with a background in calculus, linear algebra, and basic real analysis, including topological notions of convergence and connectedness. This book is a result of the MASS course in algebra at Penn State University in the fall semester of 2009. This book is published in cooperation with Mathematics Advanced Study Semesters.

## Book Information

Series: Student Mathematical Library

Paperback: 420 pages

Publisher: American Mathematical Society (April 7, 2017)

Language: English

ISBN-10: 1470434792

ISBN-13: 978-1470434793

Product Dimensions: 1 x 5.5 x 8.2 inches

Shipping Weight: 1.1 pounds (View shipping rates and policies)

Average Customer Review: Be the first to review this item

Best Sellers Rank: #698,345 in Books (See Top 100 in Books) #93 in Books > Science & Math > Mathematics > Pure Mathematics > Group Theory #7945 in Books > Textbooks > Science &

## Customer Reviews

Vaughn Climenhaga, University of Houston, TX. Anatole Katok, Pennsylvania State University, University Park, PA.

[Download to continue reading...](#)

Elementary Algebraic Geometry (Student Mathematical Library, Vol. 20) (Student Mathematical Library, V. 20) From Groups to Geometry and Back (Student Mathematical Library) Back Stretching: Back Strengthening And Stretching Exercises For Everyone (lower back pain, healing back pain, stretching exercises, back pain treatment, ... pain relief, stretching, back pain Book 1) Groups and Symmetries: From Finite Groups to Lie Groups (Universitext) The Mathematical Theory of Symmetry in Solids: Representation Theory for Point Groups and Space Groups (Oxford Classic Texts in the Physical Sciences) Modern Geometry – Methods and Applications: Part I: The Geometry of Surfaces, Transformation Groups, and Fields (Graduate Texts in Mathematics) (Pt. 1) Lectures on Fractal Geometry and Dynamical Systems (Student Mathematical Library) Fundamental Algebraic Geometry (Mathematical Surveys and Monographs) (Mathematical Surveys and Monographs Series (Sep.Title P) An Introduction to the Mathematical Theory of Waves (Student Mathematical Library, V. 3) Algebraic Geometry: A Problem Solving Approach (Student Mathematical Library) Groups, Languages and Automata (London Mathematical Society Student Texts) Leading Life-Changing Small Groups (Groups that Grow) Transformational Groups: Creating a New Scorecard for Groups Patai's 1992 Guide to the Chemistry of Functional Groups (Patai's Chemistry of Functional Groups) The Chemistry of Double-Bonded Functional Groups, Supplement A3, 2 Part Set (Patai's Chemistry of Functional Groups) Young Tableaux: With Applications to Representation Theory and Geometry (London Mathematical Society Student Texts) Undergraduate Algebraic Geometry (London Mathematical Society Student Texts) The Mathematical Theory of Non-uniform Gases: An Account of the Kinetic Theory of Viscosity, Thermal Conduction and Diffusion in Gases (Cambridge Mathematical Library) Glencoe Geometry, Student Edition (MERRILL GEOMETRY) Geometry, Student Edition (MERRILL GEOMETRY)

[Contact Us](#)

[DMCA](#)

[Privacy](#)

FAQ & Help