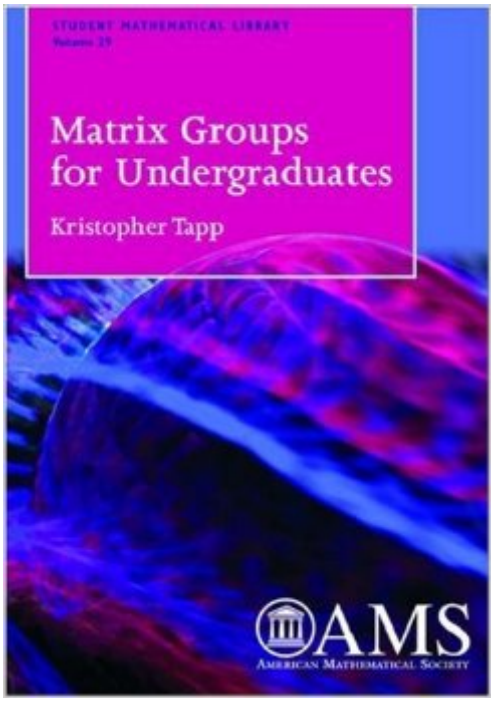
# Matrix Groups For Undergraduates (Student Mathematical Library,)



## Synopsis

Matrix groups are a beautiful subject and are central to many fields in mathematics and physics. They touch upon an enormous spectrum within the mathematical arena. This textbook brings them into the undergraduate curriculum. It is excellent for a one-semester course for students familiar with linear and abstract algebra and prepares them for a graduate course on Lie groups. Matrix Groups for Undergraduates is concrete and example-driven, with geometric motivation and rigorous proofs. The story begins and ends with the rotations of a globe. In between, the author combines rigor and intuition to describe basic objects of Lie theory: Lie algebras, matrix exponentiation, Lie brackets, and maximal tori. The volume is suitable for graduate students and researchers interested in group theory.

## Book Information

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Average Customer Review: 4.4 out of 5 starsÂ Â See all reviewsÂ (7 customer reviews)

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## Customer Reviews

It’s true as the other reviewers have said: this is an exceptionally good introduction to Lie groups and Lie algebras via matrix groups. It’s also suitable for self-study provided you have the required math background. Although it’s very much in the definition-theorem-proof mode, there’s plenty of insightful and well-written exposition motivating the formal development.My only complaint is that there are no solutions to any exercises and even worse, the proofs of a number of propositions are left to the reader. This detracts from the value of the book for self-study, but not too much because on balance, in my view, the sheer excellence of the presentation pretty much makes up for that all too common "sin of omission".The book is extremely concise: only about 137 small pages excluding

exercises (no solutions) and back matter. To illustrate: in the chapter (pp. 5-20), one rapidly covers fields and skew-fields (pp. 7-8), quaternions (pp 8-9); the real, complex and quaternion skew-field inclusions (p. 10); matrices as linear transformations (pp. 15-16); general linear groups (pp. 17-18); and finally, change of basis via conjugation (pp. 18-20). In its entirety, the book covers, in the same no-nonsense way: Ch 1. Matrices, Ch. 2 All matrix groups are real matrix groups, Ch. 3 The orthogonal groups, Ch 4. The topology of matrix groups, Ch 5. Lie algebras, Ch 6. Matrix exponentiation, Ch. 7 Matrix groups as manifolds, Ch 8. The Lie bracket, Ch 9. Maximal tori. And, as another reviewer pointed out, the author's AMS website has a free download, Ch 10. Roots, and an errata sheet.