

1009.22001

Baker, Andrew**Matrix groups. An introduction to Lie group theory.** (English)

Springer Undergraduate Mathematics Series. London: Springer. xi, 330 p. DM 74.79; sFr. 66.34; £19.00; \$ 39.95 (2002). [ISBN 1-85233-470-3/pbk]

This book is an introduction to Lie group theory with focus on the matrix case. Chapter one presents several standard matrix groups: $GL_n(K)$, $SL_n(K)$, $O(n)$, $SO(n)$, $U(n)$, $SU(n)$, the Lorentz groups and symplectic groups. Topological aspects are mentioned. Chapter two deals with the exponential of matrices and the related one-parameter subgroups. The Lie algebra and associated entities is the theme of chapter three. The next two chapters treat various topics on algebras and examples (Clifford algebras, spinor groups, quaternionic groups, automorphism groups of algebras). Chapter six details the Lorentz group. A next part introduces to abstract Lie groups and the differential geometric perspective, homogeneous spaces, the connectivity of matrix groups. A final part introduces to compact connected Lie groups, tori, semi-simple decompositions, the adjoint representation. Chapter twelve presents root systems, Weyl groups and Dynkin diagrams. Exercises are included and hints for the solution to some of them are located at the end. One finds also a bibliography (29 entries) and an index.

This book can be recommended to students, making Lie group theory more accessible to them.

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Keywords : orthogonal groups; Clifford algebras; Lie group theory; matrix groups; Lorentz groups; symplectic groups; Lie algebra; spinor groups; quaternionic groups; automorphism groups of algebras; tori; semi-simple decompositions; adjoint representation; root systems; Weyl groups; Dynkin diagrams

Classification :

- *22-01 Textbooks (topological groups)
- 57-01 Textbooks (manifolds)
- 22E46 Semi-simple Lie groups and their representations
- 17-01 Textbooks (nonassoc. rings and algebras)
- 15A66 Clifford algebras

Cited in ...