

## Preface to the Second Edition

This volume is a completely new version of the book under the same title, which appeared in 1981 as Volume 9 in the series “Progress in Mathematics,” and which has been out of print for some time. That book had its origin in notes (taken by Hassan Azad) from a course on the theory of linear algebraic groups, given at the University of Notre Dame in the fall of 1978. The aim of the book was to present the theory of linear algebraic groups over an algebraically closed field, including the basic results on reductive groups. A distinguishing feature was a self-contained treatment of the prerequisites from algebraic geometry and commutative algebra.

The present book has a wider scope. Its aim is to treat the theory of linear algebraic groups over arbitrary fields, which are not necessarily algebraically closed. Again, I have tried to keep the treatment of prerequisites self-contained.

While the material of the first ten chapters covers the contents of the old book, the arrangement is somewhat different and there are additions, such as the basic facts about algebraic varieties and algebraic groups over a ground field, as well as an elementary treatment of Tannaka’s theorem in Chapter 2. Errors – mathematical and typographical – have been corrected, without (hopefully) the introduction of new errors. These chapters can serve as a text for an introductory course on linear algebraic groups.

The last seven chapters are new. They deal with algebraic groups over arbitrary fields. Some of the material has not been dealt with before in other texts, such as Rosenlicht’s results about solvable groups in Chapter 14, the theorem of Borel of Tits on the conjugacy over the ground field of maximal split torus in an arbitrary linear algebraic group in Chapter 15 and the Tits classification of simple groups over a ground field in Chapter 17.

The prerequisites from algebraic geometry are dealt with in Chapter 11.

I am grateful to many people for comments and assistance: P. Hewitt and Zhe-Xian Wang sent me several years ago lists of corrections of the second printing of the old book, which were useful in preparing the new version. A. Broer, Konstanze Rietsch and W. Soergel communicated lists of comments on the first part of the present book and K. Bongartz, J. C. Jantzen, F. Knop and W. van der Kallen commented on points of detail. The latter also provided me with pictures, and W. Casselman provided Dynkin and Tits diagrams. A. de Meijer gave frequent help in coping with the mysteries of computers.

Lastly, I thank Birkhäuser – personified by Ann Kostant – for the help (and patience) with the preparation of this second edition.

T. A. Springer



<http://www.springer.com/978-0-8176-4839-8>

Linear Algebraic Groups

Springer, T.A.

1998, XII, 334 p., Softcover

ISBN: 978-0-8176-4839-8

A product of Birkhäuser Basel