Preface

Toroidal groups are the missing links between torus groups and any complex Lie groups. Many phenomena of complex Lie groups such as pseudoconvexity and the structure of cohomology groups can be understood only through the concept of toroidal groups. The different behavior of the cohomology groups of complex Lie groups can be characterized by the properties of their toroidal groups appearing in their centers.

Toroidal groups have not been treated systematically in a book. So the oldest living mathematician who worked in this field and the youngest working in it decided to give a comprehensive survey about the main results concerning these groups and to discuss open problems.

Toroidal groups are the non–compact generalization of the torus groups. As complex manifolds they are convex in the sense of Andreotti and Grauert. As complex Lie groups some of them have a similar behavior to complex tori, others are different with for example non–Hausdorff cohomology groups, whence completely new methods must be used.

The aim of these lecture notes is to describe the fundamental properties of toroidal groups. As a result of the meromorphic reduction theorem the quasi–Abelian varieties are of special interest. Their basic description ends in the third chapter with the Main Theorem.

This theory - in honour of SOPHUS LIE - was introduced to a wide public at the Conference "100 Years after Sophus Lie" in Leipzig, on July 8-9, 1999.

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