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The geometry of complex domains is a subject with roots extending back more than a century, to the uniformization theorem of Poincaré and Koebe and the resulting proof of existence of canonical metrics for hyperbolic Riemann surfaces. In modern times, developments in several complex variables by Bergman, Hörmander, Andreotti-Vesentini, Kohn, Fefferman, and others have opened up new possibilities for the unification of complex function theory and complex geometry. In particular, geometry can be used to study biholomorphic mappings in remarkable ways. This book presents a complete picture of these developments.

Beginning with the one-variable case_background information which cannot be found elsewhere in one place_the book presents a complete picture of the symmetries of domains from the point of view of holomorphic mappings. It describes all the relevant techniques, from differential geometry to Lie groups to partial differential equations to harmonic analysis. Specific concepts addressed include:
covering spaces and uniformization;
Bergman geometry;
automorphism groups;
invariant metrics;
the scaling method.

All modern results are accompanied by detailed proofs, and many illustrative examples and figures appear throughout.

Written by three leading experts in the field, The Geometry of Complex Domains is the first book to provide systematic treatment of recent developments in the subject of the geometry of complex domains and automorphism groups of domains. A unique and definitive work in this subject area, it will be a valuable resource for graduate students and a useful reference for researchers in the field.