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Autore	Gurlebeck Klaus
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Nota di contenuto	1.Basic Properties of Holomorphic Functions -- 2.Conformal and Quasi-conformal Mappings -- 3.Function Theoretic Function spaces -- 4.Operator Calculus -- 5.Decompositions -- 6.Some First Order Systems of Partial Differential Equations -- 7.Boundary Value Problems of Second Order Partial Differential Equations -- 8.Some Initial-boundary Value Problems -- 9.Riemann-Hilbert Problems -- 10.Initial Boundary Value Problems on the Sphere -- 11.Fourier Transforms -- Bibliography -- Index.
Sommario/riassunto	This book presents applications of hypercomplex analysis to boundary value and initial-boundary value problems from various areas of mathematical physics. Given that quaternion and Clifford analysis offer natural and intelligent ways to enter into higher dimensions, it starts with quaternion and Clifford versions of complex function theory including series expansions with Appell polynomials, as well as Taylor

and Laurent series. Several necessary function spaces are introduced, and an operator calculus based on modifications of the Dirac, Cauchy-Fueter, and Teodorescu operators and different decompositions of quaternion Hilbert spaces are proved. Finally, hypercomplex Fourier transforms are studied in detail. All this is then applied to first-order partial differential equations such as the Maxwell equations, the Carleman-Bers-Vekua system, the Schrödinger equation, and the Beltrami equation. The higher-order equations start with Riccati-type equations. Further topics include spatial fluid flow problems, image and multi-channel processing, image diffusion, linear scale invariant filtering, and others. One of the highlights is the derivation of the three-dimensional Kolosov-Mushkelishvili formulas in linear elasticity. Throughout the book the authors endeavor to present historical references and important personalities. The book is intended for a wide audience in the mathematical and engineering sciences and is accessible to readers with a basic grasp of real, complex, and functional analysis.