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Rafal Ablamowicz and Garret Sobczyk

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Lectures on Clifford (Geometric) Algebras and Applications

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The subject of Clifford (geometric) algebras offers a unified algebraic framework for the direct expression of the geometric concepts underlying the mathematical theories of linear and multilinear algebra, projective and affine geometries, and differential geometry. This bird's-eye view of Clifford (geometric) algebras and their applications is presented by six of the world's leading experts in the field.

Key topics and features of this systematic exposition:

- An Introductory chapter on Clifford Algebras by Perti Lounesto
- Ian Porteous reveals the mathematical structure of Clifford algebras in terms of the classical groups
- John Ryan introduces the basic concepts of Clifford analysis, which extends the well-known complex analysis of the plane to three and higher dimensions
- William E. Baylis investigates some of the extensive applications that have been made in mathematical physics, including the basic ideas of electromagnetism and special relativity
- John Selig explores the successes that Clifford algebras, especially quaternions and bi-quaternions, have found in computer vision and robotics
- Thomas Branson discusses some of the deepest results that Clifford algebras have made possible in our understanding of differential geometry
- Editors (Appendix) give an extensive review of various software packages for computations with Clifford algebras including standalone programs, on-line calculators, special purpose numeric software, and symbolic add-ons to computer algebra systems

This text will serve beginning graduate students and researchers in diverse areas---mathematics, physics, computer science and engineering; it will be useful both for newcomers who have little prior knowledge of the subject and established professionals who wish to keep abreast of the latest applications.

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