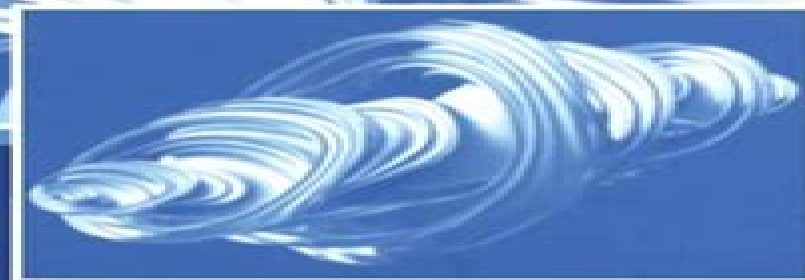


Clifford Algebras with Numeric and Symbolic Computations



Rafał Abłamowicz
Pertti Lounesto
Josep M. Parra

Editors

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Clifford Algebras With Numeric And Symbolic Computations

**Rafał Abłamowicz, Pertti
Lounesto, Josep M. Parra**



Clifford Algebras With Numeric And Symbolic Computations:

Clifford Algebras with Numeric and Symbolic Computations Rafal Ablamowicz, Joseph Parra, Pertti Lounesto, 1996-08-01 This edited survey book consists of 20 chapters showing application of Clifford algebra in quantum mechanics field theory spinor calculations projective geometry Hypercomplex algebra function theory and crystallography Many examples of computations performed with a variety of readily available software programs are presented in detail

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Clifford Algebras Rafal Ablamowicz, 2012-12-06 The invited papers in this volume provide a detailed examination of Clifford algebras and their significance to analysis geometry mathematical structures physics and applications in engineering While the papers collected in this volume require that the reader possess a solid knowledge of appropriate background material they lead to the most current research topics With its wide range of topics well established contributors and excellent references and index this book will appeal to graduate students and researchers

Clifford Algebras and their Applications in Mathematical Physics Rafał Abłamowicz, 2000 The first part of a two volume set concerning the field of Clifford geometric algebra this work consists of thematically organized chapters that provide a broad overview of cutting edge topics in mathematical physics and the physical applications of Clifford algebras algebras and their applications in physics Algebraic geometry cohomology non commutative spaces q deformations and the related

quantum groups and projective geometry provide the basis for algebraic topics covered Physical applications and extensions of physical theories such as the theory of quaternionic spin a projective theory of hadron transformation laws and electron scattering are also presented showing the broad applicability of Clifford geometric algebras in solving physical problems Treatment of the structure theory of quantum Clifford algebras the connection to logic group representations and computational techniques including symbolic calculations and theorem proving rounds out the presentation

Lectures on Clifford (Geometric) Algebras and Applications Rafal Ablamowicz, Garret Sobczyk, 2011-06-28 The subject of Clifford geometric algebras offers a unified algebraic framework for the direct expression of the geometric concepts in algebra geometry and physics This bird s eye view of the discipline is presented by six of the world s leading experts in the field it features an introductory chapter on Clifford algebras followed by extensive explorations of their applications to physics computer science and differential geometry The book is ideal for graduate students in mathematics physics and computer science it is appropriate both for newcomers who have little prior knowledge of the field and professionals who wish to keep abreast of the latest applications

Geometric Algebra with Applications in Science and Engineering Eduardo Bayro Corrochano, Garret Sobczyk, 2011-06-28 The goal of this book is to present a unified mathematical treatment of diverse problems in mathematics physics computer science and engineering using geometric algebra Geometric algebra was invented by William Kingdon Clifford in 1878 as a unification and generalization of the works of Grassmann and Hamilton which came more than a quarter of a century before Whereas the algebras of Clifford and Grassmann are well known in advanced mathematics and physics they have never made an impact in elementary textbooks where the vector algebra of Gibbs Heaviside still predominates The approach to Clifford algebra adopted in most of the articles here was pioneered in the 1960s by David Hestenes Later together with Garret Sobczyk he developed it into a unified language for mathematics and physics Sobczyk first learned about the power of geometric algebra in classes in electrodynamics and relativity taught by Hestenes at Arizona State University from 1966 to 1967 He still vividly remembers a feeling of disbelief that the fundamental geometric product of vectors could have been left out of his undergraduate mathematics education Geometric algebra provides a rich general mathematical framework for the development of multilinear algebra projective and affine geometry calculus on a manifold the representation of Lie groups and Lie algebras the use of the horosphere and many other areas This book is addressed to a broad audience of applied mathematicians physicists computer scientists and engineers

CRC Concise Encyclopedia of Mathematics Eric W. Weisstein, 2002-12-12 Upon publication the first edition of the CRC Concise Encyclopedia of Mathematics received overwhelming accolades for its unparalleled scope readability and utility It soon took its place among the top selling books in the history of Chapman Hall CRC and its popularity continues unabated Yet also unabated has been the d

A Survey of Knot Theory Akio Kawauchi, 2012-12-06 Knot theory is a rapidly developing field of research with many applications not only for mathematics The present volume written by a well known specialist gives a

complete survey of knot theory from its very beginnings to today's most recent research results. The topics include Alexander polynomials, Jones type polynomials and Vassiliev invariants. With its appendix containing many useful tables and an extended list of references with over 3 500 entries, it is an indispensable book for everyone concerned with knot theory. The book can serve as an introduction to the field for advanced undergraduate and graduate students. Also, researchers working in outside areas such as theoretical physics or molecular biology will benefit from this thorough study, which is complemented by many exercises and examples.

Clifford (Geometric) Algebras William E. Baylis, 2012-12-06. This volume is an outgrowth of the 1995 Summer School on Theoretical Physics of the Canadian Association of Physicists (CAP) held in Banff, Alberta, in the Canadian Rockies from July 30 to August 12, 1995. The chapters, based on lectures given at the School, are designed to be tutorial in nature and many include exercises to assist the learning process. Most lecturers gave three or four fifty-minute lectures aimed at relative novices in the field. More emphasis is therefore placed on pedagogy and establishing comprehension than on erudition and superior scholarship. Of course, new and exciting results are presented in applications of Clifford algebras, but in a coherent and user-friendly way to the nonspecialist. The subject area of the volume is Clifford algebra and its applications. Through the geometric language of the Clifford algebra approach, many concepts in physics are clarified, united, and extended in new and sometimes surprising directions. In particular, the approach eliminates the formal gaps that traditionally separate classical quantum and relativistic physics. It thereby makes the study of physics more efficient and the research more penetrating and it suggests resolutions to a major physics problem of the twentieth century, namely, how to unite quantum theory and gravity. The term geometric algebra was used by Clifford himself, and David Hestenes has suggested its use in order to emphasize its wide applicability and because the developments by Clifford were themselves based heavily on previous work by Grassmann, Hamilton, Rodrigues, Gauss, and others.

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