Bibliography

S.L. Altmann. *Rotations, Quaternions, and Double Groups*. Clarendon Press, Oxford, 1986.

S.L. Altmann. Hamilton, Rodrigues, and the quaternion scandal. *Mathematics Magazine*, **62**(5):291, 1989.

N. Andersson and B.P. Jensen. Scattering by black holes. In R. Pike and P. Sabatier, editors, *Scattering*. Academic Press Ltd, London, 2000.

S.S. Antman. *Nonlinear Problems in Elasticity*. Springer–Verlag, Berlin, 1995.

L. Aramanovitch. Spacecraft orientation based on space object observations by means of quaternion algebra. *J. Guidance Control and Dynamics*, **18**:859–866, 1995.

A.O. Barut and I.H. Duru. Path integral formulation of quantum electrodynamics from classical particle trajectories. *Phys. Rep.*, **172**(1):1, 1989.

A.O. Barut and N. Zanghi. Classical models of the Dirac electron. *Phys. Rev. Lett.*, **52**(23):2009, 1984.

I.W. Benn and R.W. Tucker. *An Introduction to Spinors and Geometry*. Adam Hilger, Bristol, 1988.

F.A. Berezin. *The Method of Second Quantization*. Academic Press Ltd, London, 1966.

F.A. Berezin. *Introduction to Superanalysis*. Reidel, Dordrecht, 1987.

F.A. Berezin and M.S. Marinov. Particle spin dynamics as the Grassmann variant of classical mechanics. *Ann. Phys.*, **104**:336, 1977.

J.D. Bjorken and S.D. Drell. *Relativistic Quantum Mechanics*. McGraw-Hill, New York, 1964.

D.A. Brannan, M.F. Espleen and J.J. Gray. *Geometry*. Cambridge University Press, Cambridge, 1999.

G. Breit. The effect of retardation on the interaction of two electrons. *Phys. Rev.*, **34**(4):553, 1929.

B. Carter. Axisymmetric black hole has only two degrees of freedom. *Phys. Rev. Lett.*, **26**(6):331, 1971.

T.E. Cecil. *Lie Sphere Geometry*. Springer–Verlag, New York, 1992.

A.D. Challinor et al. A relativistic, causal account of a spin measurement. *Phys. Lett. A*, **218**:128, 1996.

S. Chandrasekhar. *The Mathematical Theory of Black Holes*. Oxford University Press, Oxford, 1983.

T. Cheng and L. Li. *Gauge Theory of Elementary Particle Physics.* Oxford University Press, Oxford, 1984.

M. Chisholm. *Such Silver Currents.* Lutterworth Press, Cambridge, 2002.

W.K. Clifford. *Mathematical Papers.* Macmillan, London, 1882.

S. Coleman. *Aspects of Symmetry.* Cambridge University Press, Cambridge, 1985.

P.A. Collins, R. Delbourgo and R. M. Williams. On the elastic Schwarzschild scattering cross section. *J. Phys. A*, **6**:161–169, 1973.

A. Connes and J. Lott. Particle models and non-commutative geometry. *Nucl. Phys. B*, **18**:29, 1990.

A.H. Cook. A Hamiltonian with linear kinetic energy for systems of many bodies. *Proc. R. Soc. Lond. A*, **415**:35, 1988.

E.T. Copson. On electrostatics in a gravitational field. *Proc. R. Soc. Lond. A*, **118**:184, 1928.

R. Coquereaux, A. Jadczyk and D. Kastler. Differential and integral geometry of Grassmann algebras. *Rev. Math. Phys.* **3**(1):63, 1991.

J.F. Cornwell. *Group Theory in Phsics I.* Academic Press Ltd, London, 1984a.

J.F. Cornwell. *Group Theory in Phsics II.* Academic Press Ltd, London, 1984b.

J.F. Cornwell. *Group Theory in Physics III.* Academic Press Ltd, London, 1989.

B. de Witt. *Supermanifolds.* Cambridge University Press, Cambridge, 1984.

S. Deser, R. Jackiw and G. 't Hooft. Three-dimensional Einstein gravity: Dynamics of flat space. *Ann. Phys.*, **152**:220, 1984.

R. d'Inverno. *Introducing Einstein's Relativity.* Oxford University Press, Oxford, 1992.

C.J.L. Doran. Geometric algebra and its application to mathematical physics. PhD thesis, Cambridge University, 1994.

C.J.L. Doran. New form of the Kerr solution. *Phys. Rev. D*, **61**(6):067503, 2000.

C.J.L. Doran and A.N. Lasenby. Perturbation theory calculation of the black hole elastic scattering cross section. *Phys. Rev. D*, **66**(2):024006, 2002.

C.J.L. Doran, A.N. Lasenby and S.F. Gull. States and operators in the spacetime algebra. *Found. Phys.*, **23**(9):1239, 1993a.

C.J.L. Doran, A.N. Lasenby and S.F. Gull. Grassmann mechanics, multivector derivatives and geometric algebra. In Z. Oziewicz, B. Jancewicz and A. Borowiec, editors, *Spinors, Twistors, Clifford Algebras and Quantum Deformations*, page 215. Kluwer Academic, Dordrecht, 1993b.

C.J.L. Doran, A.N. Lasenby and S.F. Gull. Physics of rotating cylindrical strings. *Phys. Rev. D*, **54**(10):6021, 1996.

C.J.L. Doran *et al.* Lie groups as spin groups. *J. Math. Phys.*, **34**(8):3642, 1993.

C.J.L. Doran *et al.* Lectures in geometric algebra. In W.E. Baylis, editor, *Clifford (Geometric) Algebras*, pages 65–236. Birkhäuser, Boston, 1996a.

C.J.L Doran et al. Spacetime algebra and electron physics. *Adv. Imag. & Elect. Phys.*, **95**:271, 1996b.

C.J.L Doran et al. Effects of spin-torsion in gauge theory gravity. *J. Math. Phys.*, **39**(6):3303, 1998.

L. Dorst, C. Doran and J. Lasenby, editors. *Applications of Geometric Algebra in Computer Science and Engineering.* Birkhäuser, Boston, 2002.

A.W.M. Dress and T.F. Havel. Distance geometry and geometric algebra. *Found. Phys.*, **23**(10):1357–1374, 1993.

A.S. Eddington. *Relativity Theory of Protons and Electrons.* Cambridge University Press, Cambridge, 1936.

R.P. Feynman. *Quantum Electrodynamics.* Addison–Wesley, Reading, MA, 1961.

R.P. Feynman, F.B. Morningo and W.G. Wagner. *Feynman Lectures on Gravitation.* Addison–Wesley, Reading, MA, 1995.

A.P. French. *Special Relativity.* Nelson, London, 1968.

J.A.H. Futterman, F.A. Handler and R.A. Matzner. *Scattering from Black Holes.* Cambridge University Press, Cambridge, 1988.

A.P. Galeao and P.L. Ferreira. General method for reducing the two-body Dirac equation. *J. Math. Phys.*, **33**(7):2618, 1992.

R. Gautreau. Curvature coordinates in cosmology. *Phys. Rev. D*, **29**(2):186, 1984.

R. Gautreau and J.M. Cohen. Gravitational collapse in a single coordinate system. *Am. J. Phys.*, **63**(11):991, 1995.

H. Georgi. *Lie Algebras in Particle Physics.* Benjamin/Cummings, Reading, MA, 1982.

J.W. Gibbs. *Collected Papers,* Volumes I and II. Longmans, Green and Co., London, 1906.

R. Gilmore. *Lie groups, Lie algebras and Some of Their Applications.* Wiley, New York, 1974.

M. Göckeler and T. Schucker. *Differential Geometry, Gauge Theories, and Gravity.* Cambridge University Press, Cambridge, 1987.

H. Goldstein. *Classical Mechanics.* Addison–Wesley, Reading, MA, 1950.

I.S. Gradshteyn and I.M. Ryzhik. *Table of Integrals, Series and Products,* fifth edition. Academic Press Ltd, London, 1994.

W.T. Grandy, Jr. *Relativistic Quantum Mechanics of Leptons and Fields.* Kluwer Academic, Dordrecht, 1991.

W. Greiner. *Relativistic Quantum Mechanics.* Springer–Verlag, Berlin, 1990.

S.F. Gull, A.N. Lasenby and C.J.L. Doran. Imaginary numbers are not real — the geometric algebra of spacetime. *Found. Phys.*, **23**(9):1175, 1993a.

S.F. Gull, A.N. Lasenby and C.J.L. Doran. Electron paths, tunnelling and diffraction in the spacetime algebra. *Found. Phys.*, **23**(10):1329, 1993b.

L.N. Hand and J.D. Finch. *Analytical Mechanics.* Cambridge University Press, Cambridge, 1998.

R. S. Hanni and R. Ruffini. Lines of force of a point charge near a Schwarzschild black hole. *Phys. Rev. D.*, **8**(10):3259, 1973.

T.F. Havel and C.J.L. Doran. Geometric algebra in quantum information processing. In S.J. Lomonaco and H.E. Brandt, editors, *Quantum Computation and Information*, pages 81–100. American Mathematical Society, Providence, RI, 2002a.

T.F. Havel and C.J.L. Doran. Interaction and entanglement in the multiparticle spacetime algebra. In L. Dorst, C.J.L. Doran and J. Lasenby, editors, *Applications of Geometric Algebra in Computer Science and Engineering*, page 229. Birkhäuser, Boston, 2002b.

T.F. Havel et al. Geometric algebra methods in quantum information processing by NMR spectroscopy. In E. Bayro-Corrochanno and G. Sobczyk, editors, *Geometric ALgebra with Applications in Science and Engineering*, page 281. Birkhäuser, Boston, 2001.

D. Hestenes. *Space-Time Algebra.* Gordon and Breach, New York, 1966.

D. Hestenes and R. Gurtler. Local observables in quantum theory. *Am. J. Phys.*, **39**:1028, 1971.

D. Hestenes. Proper particle mechanics. *J. Math. Phys.*, **15**(10):1768, 1974a.

D. Hestenes. Proper dynamics of a rigid point particle. *J. Math. Phys.*, **15**(10):1778, 1974b.

D. Hestenes. Geometry of the Dirac theory. In J. Keller, editor, *The Mathematics of Physical Spacetime*, page 67. UNAM, Mexico, 1982a.

D. Hestenes. Space-time structure of weak and electromagnetic interactions. *Found. Phys.*, **12**(2):153, 1982b.

D. Hestenes. Celestial mechanics with geometric algebra. *Celestial Mech.*, **30**:151–170, 1983.

D. Hestenes. Curvature calculations with spacetime algebra. *Int. J. Theor. Phys.*, **25**(6):581, 1986.

D. Hestenes. The zitterbewegung interpretation of quantum mechanics. *Found. Phys.*, **20**(10):1213, 1990.

D. Hestenes. The design of linear algebra and geometry. *Acta Appl. Math.*, **23**:65, 1991.

D. Hestenes. Invariant body kinematics: I. Saccadic and compensatory eye movements. *Neural Networks*, **7**(1):65, 1994a.

D. Hestenes. Invariant body kinematics: II. Reaching and neurogeometry. *Neural Networks*, **7**(1):79, 1994b.

D. Hestenes. *New Foundations for Classical Mechanics,* second edition. Kluwer Academic Publishers, Dordrecht, 1999.

D. Hestenes. Old wine in new bottles: a new algebraic framework for computational geometry. In E.D. Bayro-Corrochano and G. Sobcyzk, editors, *Geometric Algebra with Applications in Science and Engineering*, page 16. Birkhäuser Boston, 2001.

D. Hestenes and G. Sobczyk. *Clifford Algebra to Geometric Calculus.* Reidel, Dordrecht, 1984.

D. Hestenes and R. Ziegler. Projective geometry with Clifford algebra. *Acta. Appli. Math.*, **23**:25, 1991.

D. Hestenes, H. Li and A. Rockwood. Generalized homogeneous coordinates for computational geometry. In G. Sommer, editor, *Geometric Computing with Clifford Algebras.* Springer–Verlag, Berlin, 1999a.

D. Hestenes, H. Li and A. Rockwood. New algebraic tools for classical geometry. In G. Sommer, editor, *Geometric Computing with Clifford Algebras.* Springer–Verlag, Berlin, 1999b.

R. Heumann and N. S. Manton. Classical supersymmetric mechanics. *Ann. Phys.*, **284**:52–88, 2000.

C. Itzykson and J-B. Zuber. *Quantum Field Theory.* McGraw–Hill, New York, 1980.

J.D. Jackson. *Classical Electrodynamics,* third edition. Wiley, New York, 1999.

B. Jancewicz. *Multivectors and Clifford Algebras in Electrodynamics.* World Scientific, Singapore, 1989.

B. Jensen and H.H. Soleng. General-relativistic model of a spinning cosmic string. *Phys. Rev. D*, **45**(10):3528, 1992.

L. C. Kannenberg. *The Ausdehnungslehre of 1844 and Other Works.* Open Court Publ., Chicago, 1995.

R.P. Kerr. Gravitational field of a spinning mass as an example of algebraically special metrics. *Phys. Rev. Lett.*, **11**(5):237, 1963.

T.W.B. Kibble. Lorentz invariance and the gravitational field. *J. Math. Phys.*, **2**(3):212, 1961.

M. Kline. *Mathematical Thought from Ancient to Modern Times.* Oxford University Press, Oxford, 1972.

Y. Koide. Exactly solvable model of relativistic wave equations and meson spectra. *Il Nuovo Cim.*, **70A**(4):411, 1982.

B.A. Kupershmidt. *The Variational Principles of Dynamics*. World Scientific, Singapore, 1992.

A.N. Lasenby and J. Lasenby. Applications of geometric algebra in physics and links with engineering. In E. Bayro and G. Sobczyk, editors, *Geometric algebra: A Geometric Approach to Computer Vision, Neural and Quantum Computing, Robotics and Engineering*, pages 430–457. Birkhäuser, Boston, 2000a.

A.N. Lasenby and J. Lasenby. Surface evolution and representation using geometric algebra. In R. Cippola, editor, *The Mathematics of Surfaces IX*, pages 144–168. Institute of Mathematics and its Applications, London, 2000b.

A.N. Lasenby, C.J.L. Doran and S.F. Gull. A multivector derivative approach to Lagrangian field theory. *Found. Phys.*, **23**(10):1295, 1993a.

A.N. Lasenby, C.J.L. Doran and S.F. Gull. 2-spinors, twistors and supersymmetry in the spacetime algebra. In Z. Oziewicz, B. Jancewicz and A. Borowiec, editors, *Spinors, Twistors, Clifford Algebras and Quantum Deformations*, page 233. Kluwer Academic, Dordrecht, 1993b.

A.N. Lasenby, C.J.L. Doran and S.F. Gull. Grassmann calculus, pseudoclassical mechanics and geometric algebra. *J. Math. Phys.*, **34**(8):3683, 1993c.

A.N. Lasenby, C.J.L. Doran and S.F. Gull. Gravity, gauge theories and geometric algebra. *Phil. Trans. R. Soc. Lond. A*, **356**:487–582, 1998.

A.M. Lewis, C.J.L. Doran and A.N. Lasenby. Quadratic Lagrangians and topology in gauge theory gravity. *Gen. Rel. Grav.*, **32**(1):161, 2000.

A.M. Lewis, C.J.L. Doran and A.N. Lasenby. Electron scattering without spin sums. *Int. J. Theor. Phys.*, **40**(1), 2001.

H. Li. Hyperbolic conformal geometry with Clifford Algebra. *Int.J.Theor.Phys.*, **40**:81, 2001.

B. Linet. Electrostatics and magnetostatics in the Schwarzschild metric. *J. Phys. A*, **9**(7):1081, 1976.

P. Lounesto. *Clifford Algebras and Spinors*. Cambridge University Press, Cambridge, 1997.

J.E. Marsden and T.J.R. Hughes. *Mathematical Foundations of Elasticity*. Dover Publications Inc., New York, 1994.

J.E. Marsden and T.S. Ratiu. *Introduction to Mechanics and Symmetry*. Springer–Verlag, Berlin, 1994.

K. Martel and E. Poisson. Regular coordinate systems for Schwarzschild and other spherical spacetimes. *Am. J. Phys.*, **69**(4):476, 2001.

C.W. Misner, K.S. Thorne and J.A. Wheeler. *Gravitation*. W.H. Freeman and Company, San Francisco, 1973.

M. Nakahara. *Geometry, Topology and Physics*. Adam Hilger, Bristol, 1990.

S. Nasar. *A Beautiful Mind*. Faber and Faber, London, 1998.

J. Nash. The imbedding problem for Riemannian manifolds. *Ann. Math.*, **63**(1):20, 1956.

E.T. Newman and A.I. Janis. Note on the Kerr spinning-particle metric. *J. Math. Phys.*, **6**(4):915, 1965.

E.T. Newman and R. Penrose. An approach to gravitational radiation by a method of spin coefficients. *J. Math. Phys.*, **3**(3):566–578, 1962.

R. Parker and C.J.L. Doran. Analysis of 1 and 2 particle quantum systems using geometric algebra. In L. Dorst, C.J.L. Doran and J. Lasenby, editors, *Applications of Geometric Algebra in Computer Science and Engineering*, page 215. Birkhäuser, Boston, 2002.

R. Penrose. The apparent shape of a relativistically moving sphere. *Proc. Cam. Phil. Soc.*, **55**:137–139, 1959.

R. Penrose and W. Rindler. *Spinors and Space-time,* Volume I: *Two-Spinor Calculus and Relativistic Fields*. Cambridge University Press, Cambridge, 1984.

R. Penrose and W. Rindler. *Spinors and Space-time,* Volume II: *Spinor and Twistor Methods in Space-time Geometry*. Cambridge University Press, Cambridge, 1986.

C.B.U. Perwass and J. Lasenby. A geometric analysis of the trifocal tensor. In R. Klette, G. Gimel'farb and R. Kakarala, editors, *Proceedings of Image and Vision Computing New Zealand*, pages 157–162. The University of Auckland, Auckland, 1998.

J. Preskill. Quantum computation. Lecture notes available at http://theory.caltech.edu/∼preskill/ph229, 1998.

R. Rau, D. Weiskopf and H. Ruder. Special relativity in virtual reality. In H.-C. Hege and K. Polthier, editors, *Mathematical Visualization*, pages 269–279. Springer–Verlag, Berlin, 1998.

J. Richter-Gebert and U. Kortenkamp. *The Interactive Geometry Software Cinderella*. Springer–Verlag, Berlin, 1999.

W. Rindler. *Essential Relativity*. Springer–Verlag, Berlin, 1977.

D.C. Robinson. Uniqueness of the Kerr black hole. *Phys. Rev. Lett.*, **34**(14):905, 1975.

E.E. Salpeter. Mass corrections to the fine structure of Hydrogen-like atoms. *Phys. Rev.*, **87**(2):328–343, 1952.

E.E. Salpeter and H.A. Bethe. A relativistic equation for bound-state problems. *Phys. Rev.*, **84**(6):1232, 1951.

N. Sanchez. Wave scattering and the absorption problem for a black hole. *Phys. Rev. D*, **16**(4):937–945, 1977.

N. Sanchez. Elastic scattering of waves by a black hole. *Phys. Rev. D*, **18**(6):1798–1804, 1978.

M.M. Schiffer et al. Kerr geometry as complexified Schwarzschild geometry. *J. Math. Phys.*, **14**(1):52, 1973.

G. Schubring, editor. *Hermann Gunther Grassmann (1809–1877): Visionary Mathematician, Scientist and Neohumanist Scholar*. Kluwer Academic, Dordrecht, 1996.

B.F. Schutz. *Geometrical Methods of Mathematical Physics*. Cambridge University Press, Cambridge, 1980.

J. Schwinger et al. *Classical Electrodynamics*. Perseus Books, Reading, MA, 1998.

J.G. Semple and G.T. Kneebone. *Algebraic Projective Geometry*. Clarendon Press, Oxford, 1998.

S. Somaroo, D.G. Cory and T.F. Havel. Expressing the operations of quantum computing in multiparticle geometric algebra. *Phys. Lett. A*, **240**:1–7, 1998.

S.S. Somaroo, A.N. Lasenby and C.J.L. Doran. Geometric algebra and the causal approach to multiparticle quantum mechanics. *J. Math. Phys.*, **40**(7):3327–3340, 1999.

A.X.S Stevenson and J. Lasenby. Decomplexifying the absolute conic. In R. Klette, G. Gimel'farb and R. Kakarala, editors, *Proceedings of Image and Vision Computing New Zealand*, page 163. The University of Auckland, Auckland, 1998.

E.L. Stiefel and G. Scheifele. *Linear and Regular Celestial Mechanics.* Springer–Verlag, Berlin, 1971.

J.C. Taylor. *Gauge Theories in the Twentieth Century.* Imperial College Press, London, 2001.

J. Terrell. Invisibility of the Lorentz contraction. *Phys. Rev.*, **116**(4):1041–1045, 1959.

K.S. Thorne, R.H. Price and D.A. Macdonald. *Black Holes: The Membrane Paradigm.* Yale University Press, New Haven, CT, 1986.

H. Turnbull. *The Theory of Determinants, Matrices and Inverses.* Dover, New York, 1960.

W.G. Unruh. Absorption cross section of small black holes. *Phys. Rev. D.*, **14**(12):3251, 1976.

R. Utiyama. Invariant theoretical interpretation of interaction. *Phys. Rev.*, **101**(5):1597, 1956.

A. Vilenkin and E.P.S. Shellard. *Cosmic Strings and Other Topological Defects.* Cambridge University Press, Cambridge, 1994.

T.G. Vold. An introduction to geometric algebra with an application to rigid-body mechanics. *Am. J. Phys.*, **61**(6):491, 1993a.

T.G. Vold. An introduction to geometric calculus and its application to electrodynamics. *Am. J. Phys.*, **61**(6):505, 1993b.

J. Vrbik. Celestial mechanics via quaternions. *Can. J. Phys.*, **72**:141–146, 1994.

J. Vrbik. Perturbed Kepler problem in quaterionic form. *J. Phys. A*, **28**:6245–6252, 1995.

J.A. Wheeler and R.P. Feynman. Classical electrodynamics in terms of direct interparticle action. *Rev. Mod. Phys.*, **21**(3):425, 1949.