

DEGREES

B.Sc., Physics (Carey Prize), University of Liverpool, March 1945
B.Sc., Honors in Mathematics, University of Liverpool, December 1945
M.Sc., Mathematics (differential geometry), University of Liverpool, 1947
Ph.D., Mathematics (relativity), Imperial College, London, 1956

FIELDS OF RESEARCH SPECIALIZATION

Special and general relativity
Relativistic cosmology and astrophysics

EXPERIENCE

1947-49, University of Liverpool, Assistant Lecturer in Pure Mathematics
1949-56, University of London, Cass College, Lecturer in Mathematics
1956-63, Cornell University, Instructor (2 yrs), Asst. Prof. of Mathematics
1963-69, Southwest Center for Advanced Studies (Dallas), Assoc. Professor (3 yrs),
Professor
1969 to present, the University of Texas at Dallas, Professor of Physics

VISITING APPOINTMENTS

1961-62, Visiting Lecturer, King's College, London (9 months) and University of
Hamburg (3 months)
1968-69, Visiting Professor, Istituto Matematico Guido Castelnuovo, University
of Rome (La Sapienza)
1975 (spring semester) Visiting Professor of Physics, Univ. of Vienna
1987 (spring semester) Visiting Professor of Physics, Univ. of Vienna
1983 thru 1994 (except 1990) (summer semesters) Visiting Professor, Max-
Planck Institute for Physics and Astrophysics, Garching;
1995, 1996, 1997, 2003 (summer semesters), Visiting Professor, MPI
for Gravitational Physics, Potsdam.
1984 , 1989 , 1991 , 1993 , 2000 , 2002 , 2006 (one month each) Visiting Professor,
Istituto Matematico Guido Castelnuovo, Rome, Italy
1989 (two weeks), Visiting Professor, USSR Academy of Science, Moscow
1990 (April-July) Visiting Fellow, Churchill College, Cambridge, England

SOCIETIES

American Physical Society, Fellow
Royal Astronomical Society, Fellow
International Astronomical Union, Member
International Society for General Relativity and Gravitation, Member

ACADEMIES

Honor Member (Ehrenmitglied), Austrian Academy of Sciences
Foreign Member, Academy of Sciences of Turin, Italy

EDITORSHIPS

Member, Foreign Editorial Board of Rendiconti di Matematica, Rome (1984-)
Associate Editor, American Journal of Physics (1988-91)

TEACHING PRIZES

1972-73 Physics Teaching Award, UTD
1990-91 Chancellor's Council Outstanding Teaching Award

MEDAL

1996 Gold Medal of the City of Vienna (Lifetime Achievements)

PUBLICATIONS LIST

A. BOOKS

- (1) Special Relativity, University Mathematical texts Series, Oliver and
Boyd, Edinburgh and Interscience (Wiley), New York, 1960
(1a) Special Relativity, 2nd Edition (revised and expanded), Oliver and Boyd,
 Edinburgh and Interscience (Wiley), New York, 1966
(1b) La Relatività Ristretta, Cremonese, Rome, 1971 (Italian translation of the
 above, overseen by author)
(2) Essential Relativity: Special, General, and Cosmological, Van Nostrand-
 Reinhold Co., New York, 1969
(2a) Essential Relativity: Special, General, and Cosmological, 2nd Edition
 (revised, rewritten and enlarged), Springer-Verlag, New York, 1977
(2b) Essential Relativity: Special, General, and Cosmological, 3rd Edition
 (revised), Springer-Verlag, New York, 1980
(3) Introduction to Special Relativity, Oxford University Press, 1982
(3a) Japanese translation of the above, Chijin Shokan Publishers, Tokyo, 1989

- (3b) Introduction to Special Relativity, 2nd Edition (revised and expanded), Oxford University Press, 1991
- (3c) Greek translation of the above, Leader Books, Athens 2001
- (4) (with R. Penrose) Spinors and Space-Time, Vol. I: Two-Spinor Calculus and Relativistic Fields, Cambridge University Press, 1984
- (4a) "Spinori I", Russian translation of the above, MIR Publishers, Moscow, 1987
- (5) (with R. Penrose) Spinors and Space-Time, Vol. II: Spinor and Twistor Methods in Space-Time Geometry, Cambridge University Press, 1986
- (5a) "Spinori II", Russian translation of the above, MIR Publishers, Moscow, 1989
- (6) (with A. Trautman, editors) Gravitation and Geometry: A Volume in Honor of Ivor Robinson, Bibliopolis Publishers, Naples, 1987
- (7) Relativity: Special, General, and Cosmological, Oxford University Press, 2001
- (7a) Second edition of the above (revised and expanded), Oxford U.P., 2006

B. RESEARCH ARTICLES

- (1) On the Coordination of Riemannian and Kinematic Techniques in Theoretical Cosmology, *Mon. Not. Roy. Astron. Soc.* 116, 335, 1956
- (2) Visual Horizons in World-Models, *Mon. Not. Roy. Astron. Soc.* 116, 662, 1956
- (3) Hyperbolic Motion in Curved Space-Time, *Phys. Rev.* 119, 2082, 1960
- (4) Remarks on Schrödinger's Model of DeSitter Space-Time, *Phys. Rev.* 120, 1041, 1960
- (5) A Length Contraction Paradox, *Am. J. Phys.* 29, 365, 1961
- (6) Radiation Pressure on a Rapidly Moving Surface (with D. W. Sciama), *Am. J. Phys.* 29, 645, 1961
- (7) Energy Conservation as the Basis of Relativistic Mechanics (with R. Penrose), *Am. J. Phys.* 33, 55, 1965
- (8) Energy Conservation as the Basis of Relativistic Mechanics (II), (with J. Ehlers and R. Penrose), *Am. J. Phys.* 33, 995, 1965
- (9) Elliptic Kruskal-Schwarzschild Space, *Phys. Rev. Lett.* 15, 1001, 1965
- (10) Quaternions, Bivectors, and the Lorentz Group (with J. Ehlers and I. Robinson), in *Perspectives in Geometry and Relativity*, B. Hoffmann, editor, Indiana University Press, 1966
- (11) Kruskal Space and the Uniformly Accelerated Frame, *Am. J. Phys.* 34, 1164, 1966
- (12) Counterexample to the Lentz-Schiff Argument, *Am. J. Phys.* 36, 540, 1968
- (13) Counterexample to the Tangherlini Argument, *Am. J. Phys.* 37, 72, 1969
- (14) Limits on the Cosmological Deceleration Parameter, *Ap. J.* 157, L147, 1969
- (15) On the Transformation of Force in Relativistic Statics, *Lett. Nuovo Cimento, Serie I*, 3, 742, 1970

- (16) Einstein's Priority in Recognizing Time Dilation Physically, *Am. J. Phys.* 38, 1111, 1970
- (17) A Gravitationally Induced (Machian) Magnetic Field (with J. Ehlers), *Phys. Lett.* 32A, 257, 1970
- (18) Torsion-Free World Lines in Curved Space-Time (with L. Karlov), *Phys.Rev. D* 3, 1035, 1971
- (19) An Electromagnetic Thirring Problem (with J. Ehlers), *Phys. Rev. D* 4, 3543, 1971
- (20) Public and Private Space-Curvature in Robertson-Walker Universes, *Gen. Rel. and Grav.* 13, 457, 1981
- (21) Analogies between Kruskal Space and de Sitter Space, *Foundns. Phys.* 15, 545, 1985
- (22) How far can Observable Relations Determine a Robertson-Walker Metric? (with J. Ehlers), *Astronomy and Astrophysics* 174, 1, 1987
- (23) A Simple Relativistic Paradox on Electrostatic Energy (with J. Denur), *Am. J. Phys.* 56, 795, 1988
- (24) A phase-space representation of FL universes containing both dust and radiation, and the inevitability of a big bang (with J. Ehlers), *Mon. Not. Royal Astr. Soc.*, 238, 503, 1989
- (25) How to determine a Tolman-Bondi universe from ideal observable and theoretical relations (with D. Suson), *Astronomy and Astrophysics*, 218, 15, 1989
- (26) Relativity and electromagnetism: the force on a magnetic monopole, *Am. J. Phys.* 57, 993, 1989
- (27) A novel phase-space representation and classification of all Friedman-1989
- (28) Rotating coordinates as tools for calculating circular geodesics and gyroscopic precession (with V. Perlick), *Gen. Relativity and Gravitation* 22, 1067, 1990
- (29) The Multipole Expansion Far From an Isolated Source (with Sir Hermann Bondi), *Gen. Relativity and Gravitation* 23, 487, 1991
- (30) The Nonreciprocity of Relative Acceleration in Relativity (with L. Mishra), *Physics Letters A* 173, 105, 1993
- (31) Successive Schwarzschild Spheres and other Rigidity Frontiers in Spherically Symmetric Dust-plus-vacuum Spacetimes (with J. Ehlers), *Physics Letters A* 180, 197, 1993
- (32) The Lense-Thirring effect exposed as anti-Machian, *Physics Letters A* 187, 236, 1994
- (33) Mach, the Expansion of the Universe, the Variation of Inertial Mass, and Lense- Thirring, in *Mach's Principle*, J. Barbour and H. Pfister, editors, Birkhäuser Boston, 1995
- (34) A Fully Focussing Gravitational Wave, in *Fisica Matematica e Ingegneria delle Structure*, G. Ferrarese, editor, Pitagora Publishers, Bologna 1995
- (35) An Addendum to Birkhoff's Theorem (with Sir Hermann Bondi), *General Relativity and Gravitation*, 29, 515, 1997

- (36) Local and Global Light Bending and Einstein's Equivalence Principle (with J. Ehlers), *General Relativity and Gravitation*, 29, 519, 1997
- (37) The case against space dragging, *Physics Letters* A233, 25, 1997.
- (38) Birkhoff's Theorem with Lambda-term and Bertotti-Kasner Space, *Phys. Lett.* A245, 363, 1998
- (39) A Plain Man's Guide to Bivectors, Biquaternions, and the Algebra and Geometry of Lorentz-transformations (with Ivor Robinson) in *On Einstein's Path*, Alex Harvey, editor, Springer-Verlag, New York 1998
- (40) Finite Foliations of Open FRW Universes and the Point-like Big Bang, *Phys. Lett.* A276, 52, 2000
- (41) Visual Horizons in World Models, *General Relativity and Gravitation J.*, 34, 131, 2002 (Reprint, with commentary, of the original 1956 MNRAS paper, now in the "Golden Oldie" series.)
- (42) Some New Results in Theoretical Cosmology, in *Gravitation and Cosmology: From the Hubble Radius to the Planck Scale*, R.L. Amoroso, G. Hunter, M. K Kafatos, J.-P. Vigiier, eds., Kluwer Academic, Dordrecht 2002
- (43) The Contribution of the Cosmological Constant to the Relativistic Bending of Light, Revisited (W.Rindler and M Ishak), *Phys.Rev.D*, 74, 043513, 2007
- (44) A New Independent Limit on the Cosmological Constant/Dark energy from the Relativistic Bending of Light by Galaxies and Clusters of Galaxies, (M Ishak, W.Rindler, J.Dossett, J.Moldenhauer, and C.Allison), *Mon.Not.Roy.Astr.Soc.*, 388, 1279-1283, 2008
- (45) Goedel, Einstein, Mach, Gamow, and Lanczos: Goedel's remarkable excursion into cosmology, *Am.J.Phys*, 77, 498-510, 2009
- (46) More on Lensing by a Cosmological Constant, (M.Ishak, W.Rindler, J.Dossett), *Mon.Not.Roy.Astr.Soc.* 404, 2152, 2010
- (47) The relevance of the cosmological constant for gravitational lensing (M.Ishak and W.Rindler), commissioned for a special issue on lensing, *General Relativity and Gravitation Journal*, 42, 2247, 2010
- (48) Goedel, Einstein, Mach, Gamow, and Lanczos: Goedel's remarkable excursion into cosmology, in *Kurt Goedel and the Foundations of Mathematics: Horizons of Truth*, M.Baaz, C.H.Papadimitriou, H.W. Putnam, D.S.Scott, and C.L.Harper, Jr, eds., Cambridge UP, 2011

C. SURVEY ARTICLES

- (1) Survey of Relativity Theory, *S.I.A.M. Review* 3, 105, 1961
- (2) What are Spinors? *Am. J. Phys.* 34, 937, 1966
- (3) Relativistic Cosmology, *Physics Today*, 20, 11, 23, 1967
- (4) Relativistic Cosmology, in *Albert Einstein's Theory of General Relativity*, G. Tauber, editor, Crown Publishers, New York, 1979

- (5) Gravitation: from Newton to Einstein, Second Annual Polykarp Kusch Lecture, printed at The University of Texas at Dallas, 1986
- (6) Black Holes and Horizons--the Geometry of Kruskal Space and Rindler Space, in *Relativity, Supersymmetry, and Strings*, A. Rosenblum, editor, Plenum Publishing Corp., New York 1990
- (7) A Phase-Space Representation and Classification for Friedman-Lemaître Universes, in *Classical Mechanics and Relativity: Relationship and Consistency*, G. Ferrarese, editor, Bibliopolis Publishers, Naples, 1991
- (8) Die Paradoxien der Relativitätstheorie, *Physik und Didaktik*, 21, 259, 1993
- (9) A possible didactics for relativistic adiabatic continuum mechanics, in *Advances in Modern Continuum Mechanics*, G. Ferrarese, editor, Pitagora Publishers, Bologna 1993
- (10) General relativity before special relativity: An unconventional overview of relativity theory, *Am. J. Phys.* 62, 887, 1994
- (11) Classical Relativity and the Vacuum, in *Le Vide: Univers du tout et du rien*, Edgard Gunzig and Simon Diner, editors, *Revue de L'Université de Bruxelles* 1998
- (12) Time from Newton to Einstein to Friedman, *KronoScope* 1, 63, 2001
- (13) What is new in Cosmology, in *Advances in General Relativity and Cosmology*, G.Ferrarese, editor, Pitagora Editrice, Bologna 2003.

D. ENCYCLOPEDIA ARTICLES

- (1) Special Theory of Relativity, Pergamon Encyclopedic Dictionary of Physics, 1962
- (2) General Theory of Relativity, Pergamon Encyclopedic Dictionary of Physics, 1962
- (3) Relativity, Van Nostrand-Reinhold Encyclopedia of Physics, 1966, updated 1972, 1982, 1985
- (4) Relativity, Merit Students Encyclopedia (MacMillan), 1975
- (5) Relativity, Encyclopedia Americana, 1980
- (6) Albert Einstein, Collier's Encyclopedia, 1985
- (7) Inertial Mass, Inertial Reference Frame, in the MacMillan Encyclopedia of Physics, 1996
- (8) Special Relativity, three 20-page articles: Kinematics, Mechanics, Electromagnetism, commissioned by Scholarpedia, 2011

E. BOOK REVIEWS

About twenty book reviews in *Physics Today*, *American Journal of Physics*, *Foundations of Physics*, etc.

