

Mathematics Publications

Nonlinear Optimization

- Variable Metric Method for Minimization, Argonne National Laboratory Report 5990 (1959).
- Variance Algorithm for Minimization, *Computer J.*, **10**, pp 406-410 (1968).
- Variance Algorithms for Minimization, in *Optimization*, ed. R. Fletcher, Academic Press, New York (1969) pp 13-20.
- Optimally Conditioned Algorithms without Line Searches, *Mathematical Programming*, **9** (1975), pp. 1-30.
- New Least Squares Algorithms, *J. Optimization Theory and Applications*, **18** (1976), pp. 187-197.
- Optimization by Non-Linear Scaling, (Technical Report, Institutt for Teoretisk Fysikk, 7034 Trondheim NTH, Norway, 1976).
- Fast Least Squares Algorithms, *American J. Physics*, **45** (1977), pp. 260-262.
- Optimization by Non-linear Scaling, Chapter VI.2 in *Numerical Software*, ed. D.A.H.Jacobs, Academic Press, NY (1978).
- Conic Approximations and Collinear Scalings for Optimizers, *SIAM J. Numerical Analysis*, **17** (1980), pp. 268-281.
- Conjugate Directions for Conic Functions, Ch.1.3, *Nonlinear Optimization*, ed. M. J. D.Powell, Academic Press, NY (1982), pp 23-28.
- Evaluation of Step Directions in Optimization Algorithms, with Jorge Nocedal, *ACM Transactions on Mathematical Software*, **11** (1985), pp. 13-19.
- Variable Metric Method for Minimization, *SIAM J. Optimization* **1** (1991), pp. 1-17.
- Notation for Quasi-Newton Methods, with R.B. Mifflin and J.L. Nazareth, *Optima*, No. 32, (March 1991), pp. 3-4.
- Conjugate Directions in Perspective, Ch. 6, *Linear and Nonlinear Conjugate Gradient-Related Methods*, ed. Loyce Adams and J. L. Nazareth, SIAM, Philadelphia (1996), pp. 79-82.
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- A characterization of convexity-preserving maps from a subset of a vector space into another vector space; with K. A. Ariyawansa and K. D. McKennon, *J. London Mathematical Society (2)* **64** (2001), pp. 179-190.

Logic and Nonstandard Analysis

- Computer Analysis of the Algebra of Relations, Argonne National Laboratory Technical Report **38** (1962).
- Near-Standard Analysis, *International Conference of Mathematicians, Abstracts*, August 1986, p. 28.
- Axioms for the Guests of Infinite Sets, *Nonstandard Analysis Conference*, Smith College, August 1988.

Physics Publications

Theoretical

- Proper Time Electron Formalism, *Phys. Rev.*, **97** (1955), pp 1131-1138.
- Proper Time Quantum Electrodynamics, *Phys. Rev.*, **97** (1955) pp 1139-1144.
- Causality in the Pion Proton Scattering, with H. L. Anderson and U.E. Kruse, *Phys. Rev.*, **100**, 339 (1955)
- Comparison of Spin Flip Dispersion Relations with Pion Nucleon Scattering Data, with M.L.Goldberger, *Phys. Rev.*, **104**, 1119 (1956)
- Dispersions in the Pion Proton Scattering, with H. L. Anderson and U. E. Kruse, *Nuovo Cimento Supplemento*, **4**, 168 (1956)
- Elementary Particles with the Symmetry of the DeSitter Group, *Proceedings of the Midwest Conference on Theoretical Physics* (1959)
- Observables in Relativistic Quantum Mechanics, with Hans Ekstein, *J. Math. Phys.*, **5**, (1964) pp 1588-1594

- Time-Dependent Multipole Analysis, *J. Physics A*, **6**, 1635-1646 (1973)
- Consequences of the Inertial Equivalence of Energy, *Foundations of Physics*, **5** (1975), pp. 525-542
- Quantum Physics of Single Systems, *Il Nuovo Cimento*, **36B** (1976), pp. 34-40
- Single System and Ensemble Interpretation of Pure Quantum States, *Physica Norvegica*, **8** (1976), pp. 223-228
- A Lorentz Invariant Continuum Mechanics, *Arkiv for Det Fysiske Seminar i Trondheim*, No. 11, 1976

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- Machine Analysis of Pion Scattering by the Maximum Likelihood Method, with H.L. Anderson, *Nuovo Cimento*, **5**, 1238 (1957).
- Spin Momentum Correlation in the Beta Decay of Polarized Li8 Nuclei, with Burgy, Novev, Perlow and Ringo, *Bull. Am. Phys. Soc., Series 11*, **2**, 2 (1957)
- A Method for Constrained Refinement of Crystal Structures, with J. P. Chesick, *Acta. Cryst.* (1975), **A31**, 586
- Application of a New Least Squares Method to Structure Refinement, with J. P. Chesick and C. Shoen, *Acta. Cryst.* (1976), **A32**, 120

Teaching

- Symmetry and Conservation in Introductory Physics, *Amer. J. Phys.*, **26**, 508 (1958)
- An Introduction to Dispersion Relations, with C. H. Holbrow, *Amer. J. Phys.*, **38** (1964), pp 762-774
- Wstep do Relacji Dyspersyjnych (translation of preceding article into Polish), *Postepy Fizyki*, **16**, 389 (1965)
- Symmetry, *Proceedings of the Boulder Conference on Physics, Comm. on College Physics*, 165 (1965)
- Algebraic Description of Motion, *Amer. J. Physics*, **42**, 764 (1974)
- Kinematics and Dynamics of Elastic Rods, *Am. J. Phys.*, **43** (1975), pp. 705-713