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DEGREES

B.A.Sc., University of British Columbia, 1944

Ph.D., Brown University, 1949

ACADEMIC SERVICE

1950-54: **Assistant Professor**, Division of Engineering Science and Applied Mechanics, Harvard University

1962-63: **Visiting Professor** of Applied Mechanics, Royal Institute of Technology, Copenhagen, Denmark

1968-present: **Professor**, University of Washington (Joint with Aeronautics & Astronautics)

1972-79: **Chairman**, Applied Mathematics Program

FULL-TIME INDUSTRIAL EXPERIENCE

1957-62: **Staff Member**, Engineering Division, Arthur D. Little, Inc.

1963-65: **Department Head**, Engineering Sciences, Sperry Rand Research Center, Sudbury, MA

1965-67: **Manager**, Mathematical Analysis Unit, The Boeing Company

CONSULTING WORK

Pratt and Whitney Aircraft Company

Arthur D. Little, Inc., Cambridge, MA

The Boeing Company (Airplane Division)

Mathematical Sciences Northwest

Program Research Inc.

Argonne National Laboratory

Others

SCIENTIFIC &

PROFESSIONAL

SOCIETIES

American Physical Society

Society for Industrial and Applied Mathematics

American Institute of Aeronautics and Astronautics

RESEARCH INTERESTS

Fluid mechanics, numerical methods, optimization, and game theory (including Las Vegas applications).

PUBLICATIONS:

Books:

Theoretical Elasticity. Cambridge: Harvard University Press, 1959.

Functions of a Complex Variable, Theory and Technique. (with G.F. Carrier and M. Krook), New York: McGraw-Hill, 1966.

Ordinary Differential Equations. (with G.F. Carrier), New York: Blaisdell Publishing Company, 229 pp., 1968. SIAM reprint (revised) to appear, 1991.

Editor, *Handbook of Applied Mathematics*. New York: Van Nostrand-Reinhold, 1265 pp., 1974. Second Edition, 1307 pp., 1983.

Numerical Methods in Engineering and Science, Van Nostrand-Reinhold, 214 pp., 1986.

Partial Differential Equations (with G.F. Carrier) New York: Academic Press, 320 pp., 1973. *Second Edition*, 1988.

Papers:

Corrections in Hot-wire Correlation Measurements. *Quarterly of Applied Mathematics*. **12**: 235. 1954.

Compressor Surge and Stall Propagation." (with H.W. Emmons and H.P. Grant) *Trans. ASME*. **77**: 455. 1955.

General Theory of Elastic Stability. *Quarterly of Applied Mathematics*. **14**: 133. 1956.

On Variational Principles and Galerkin's Procedure for Nonlinear Elasticity. (with B. Budiansky) *Quarterly of Applied Mathematics*. **14**: 328. 1956.

Notes on the Decomposition of Stress and Strain Tensors. (with B. Budiansky) *Quarterly of Applied Mathematics*. **14**: 327. 1956.

On the Finite Strip Problem. *Quarterly of Applied Mathematics*. **15**: 203. 1957.

Integral Representation for Solutions of Bessel's Difference Equation. *Journal of Mathematics and Physics*. **39**: 287. 1960.

A Computational Technique for Three-Dimensional Pin-Jointed Structures. *Proceedings of the Second Conference on Electronic Computation of the American Society of Civil Engineers*. 1961

A Digital Computer Program for the General Axially Symmetric Thin-Shell Problem. (with W.K. Sepetoski, I.W. Dingwell, and A.W. Adkins) *Journal of Applied Mechanics, Trans. ASME, Series E*. **29**: 655. 1962.

A Computational Method for Viscous Flow Problems. *Journal of Fluid Mechanics*. **21**: 611. 1965.

On the Time-Dependent Flow Between Two Rotating Disks. *Journal of Fluid Mechanics*. **21**: 623. 1965.

Impulsive End Condition for Diffusion-Type Equations. *Mathematics of Computation*. **19**: 570. 1965.

Note on the Second Derivative of a P.R. Function. *SIAM Review*. **7**: 251. 1965.

On the Viscous Flow Between Concentric Spheres. *Journal of Fluid Mechanics*. **28**: 323. 1967.

On a Differential Equation of Boundary Layer Type. *Journal of Mathematics and Physics*. **XLVII**: 134. 1968.

On Nonlinear Differential Equations of Boundary Layer Type. *Journal of Mathematics and Physics*. **47**: 351. 1968.

A Numerical Method for Incompressible Viscous Flow Problems in a Spherical Geometry. pp. 65-78 in *Studies in Numerical Analysis I*. Society for Industrial and Applied Mathematics. 1969.

Asymptotic Behavior of Solutions to the Finite Difference Wave Equation. *Mathematics of Computation*. **23**: 711. 1969.

Partial Differential Equations of Higher Order. Chapter 9 in *Handbook of Applied Mathematics*. Van Nostrand-Reinhold. 1974. Revised and extended for Second Edition. 1983.

Computation of Tidal Flow in Well-Mixed Estuaries. *Journal of the Hydraulics Division, ASCE*, **102**: 367. March 1976.

Note on Kelvin Wave Reflection in a Channel with an Arbitrary End Wall. *Journal of Geophysical and Astrophysical Fluid Dynamics*. **8**: 303. 1977.

On the Calculation of Tidal Currents in Homogeneous Estuaries. (with D. Winter). *Journal of Physical Oceanography*. **7**: 520. 1977.

Two-Layer Analysis of Steady Circulation in Stratified Fjords. (with D. Winter) *Article in Hydrodynamics of Estuaries and Fjords* (J.J. Nihoul, ed.). p. 495, Elsevier, Amsterdam. 1978.

Far-field Matching in Tidal Calculations, *Publication No. WSG 79-1*, Washington Sea Grant Program, 1979.

A Numerical Method for Shallow Water Motion onto a Beach. *Computational Methods in Applied Mechanics* (ed. T.J. Oden), North-Holland. 1980.

Dual Time Scales in Wave Problem Governed by Coupled Nonlinear Equations. *SIAM Review*. **23**: 425. 1981.

Use of Streamline Coordinates in the Numerical Solution of Compressible Flow Problems. *J. Computational Physics*. **42**: 257. 1981.

Optimal Mapping from a Sphere onto a Plane. *SIAM Review*. **24**: 469. 1982.

On Tidal Motion in a Stratified Inlet, with Particular Reference to Boundary Conditions. *J. Phys. Oceanog.* **14**: 1307. 1984.

Extension of a Numerical Streamline Method. *Comm. Appl. Num. Meth.* **1**: 177. 1985.

Numerical Solution of a Class of Steady-State Euler Equations (with D.R. Owen) *AIAA preprint 88-0625, 26th AIAA Aerospace Sciences Meeting*. 1988.

On a Modified Streamline Curvature Method for the Euler Equations, *Comm. Appl. Num. Meth.* **4**: 327. 1988.

Upwind and Downwind Effects of Numerical Approximations to Wave Equations, *Comm. Appl. Num. Meth.*, **4**: 517. 1988.

Numerical Methods Applicable to Laser Refraction through a Caustic (with W. Christiansen) *to appear*, 1990.