

## Biographical Sketch of **Ernest E Burniston**.

### **Business Address.**

Department of Mathematics,  
North Carolina State University,  
Raleigh, North Carolina 27695-8205.

### **Education.**

University of London, B.Sc. Mathematics, 1960  
University of London, Ph.D. Mathematics, 1962.

### **Employment.**

Chair of Department of Mathematics and Professor of Mathematics Emeritus, North Carolina State University, 2002 – present.

Chair of Department of Mathematics and Professor of Mathematics, North Carolina State University, 1999-2002,

Professor of Mathematics, North Carolina State University, 1989 – 1999.

Head of Department of Mathematics and Professor of Mathematics, North Carolina State University, 1980 – 1989,

Professor of Mathematics, North Carolina State University, 1972 - 1980

Associate Professor of Mathematics, North Carolina State University, 1968 - 1972

Assistant Professor of Mathematics, North Carolina State University 1965 - 1968

Senior Lecturer, Sir John Cass College, London, England, 1964 - 65

Lecturer, Sir John Cass College, London, England, 1962 - 64

### **Foreign Experience.**

1973 - 1974 Visiting Professor, University of Glasgow, Scotland

1975 (Summer) Visiting Professor, Atomic Energy Institute, Sao Paulo, Brazil.

1983 (January) Consultant on American/Italian Scientist Exchange with Exchange with C N R, Rome, Italy.

### **Society Memberships.**

Mathematical Association of America.

National Council of Teachers of Mathematics.  
North Carolina Council of Teachers of Mathematics.  
Sigma Xi, Phi Kappa Phi,

**Fields of Research Interest.**

My past interests included Transport Theory, the solution of transcendental equations and Fracture Mechanics.

My recent and current interest is Mathematics Education. In particular I am pursuing the use of technology in education and also the integration of engineering and physics into the freshman calculus courses.

**Research Grants.**

Supported on grant AFOSR-60-1779. CO-PI on Grants AFOSR-444-66, ONR N00014-68-A0187 and AFSOR-69-1779B. These grants provided continuous funding for the years 1965-1973.

NSF - SUCCEED, Integration of Mathematics, Physics and Engineering in the Freshman Year, 1993 - present. (CO-PI)

NSF - ILI Grant Funds to equip a computer teaching laboratory. (CO-PI).1993 - 1995.

NSF - Full Scale Calculus Revitalization and Evaluation Project. (CO-PI).1993 - 1996.

**Additional Professional Experience.**

Referee for numerous journals: SIAM Journal of Applied Mathematics, International Journal of Engineering Science, International Journal of Fracture Mechanics, Transport Theory and Statistical Physics, etc.

Referee for NSF Reviewer for Zentralblatt

Numerous invited talks both in this country and abroad.

**Service Experience.**

I have served on and chaired innumerable Department, College, University and UNC System committees.

President of North Carolina State University Chapter of Sigma Xi.

1989 - 1980 Chairman of the North Carolina State Faculty Senate.

Member of the UNC Faculty Assembly

Initiated and served as Chair of the UNC Mathematics Departments 1981 1989 Chairpersons Committee.

1988- present. Initiated and serve as Director of the Turbo Calculus Program at North Carolina State University. This is a program modeled upon the Professional Development Program at UC Berkeley. The program is designed to help high-risk students succeed in calculus.

### **Supervision of Graduate Work.**

Master's Students. (Thesis Students).

Brown Ian C., MA. "The General Theory of Thin Elastic Shells", University of London, 1965.

Gurley, William Q., MS. "Stress Intensity Factor for a Griffith Crack Opened by a Parabolic Pressure with a Tie, Idealized by Point Loads", North Carolina State University, 1971.

Aldridge, Allen, MS. "Some Examples of Partial Closure and Partial Immobile Equilibrium of Griffith Cracks in Single and Two Media Plates", North Carolina State University, 1992.

(Non-thesis students, all at North Carolina State University)

Brown, Charles R., Jr., M.A.M. "The Laplace Transform of the Product of Two Functions", 1967.

Burch, William F., M.A.M. "Contour Integral Solutions to Ordinary Differential Equations", 1968.

Dimmick, Paul H., M.A.M. "A Learning Program", 1968.

Denham, Charles A., M.A.M. "Factorization and Eigenvalue Problems", 1968.

Blue, Richard R., Jr., M.A.M. "The Mapping of Simply Connected Regions onto the Unit Disk", 1968.

Ph.D. Students.

Bland, Samuel R., Ph.D. "The Two-Dimensional Oscillating Airfoil in a Wind Tunnel in Subsonic Compressible Flow", 1968.

Storaasli, Olaf O., Ph D. "Solution of the Coupled Equations of Thermoelasticity, 1970. (Co-director Edward D Gurley)

Gurley, William Q., Ph.D. "Closure of a Griffith Crack by Symmetric Ties", 1973.

Lehmann, Joel P., Ph.D. "Partial Closure of a Griffith Crack Located at the Interface of Two Bonded Dissimilar Elastic Half-Planes", 1978.

### **Technical Reports.**

1. *Some problems concerning semi-circular cracks in infinite plates*, North Carolina State University Project Report, Grant No. AFOSR-444-66, File No. PSR-47/4. 1967.
2. *On the flexure of a large elastic plate containing an unstressed circular hole*, North Carolina State Project Report, Grant No. AFSOR-444-66, File No. PSR-47\5. 1967.
3. *Linear discontinuous boundary problems in the theory of functions, singular integral equations and some of their applications*, B.V. Hvedelidze, Translation of the Monograph , Trud. Tbilsk. Mat. Inst., Adad. Nauk Gruz.f SSR, XXII, pp. 3-158 (1956) North Carolina State Project Report, Grant No. AFSOR-69-1779b, File No. PSR-99\7. 197

### **Refereed Articles in Professional Journals.**

1. *Note on the basic assumptions of elastic plate theories*, *Mathematika* Vol.9, pp.127-132, 1962. (with R Tiffen)
2. *On the flexure of an infinite elastic plate containing a large unstressed circular hole*, *SIAM Journal of Applied Mathematics*, Vol. 16, No. 1, pp.109-125, 1968.
3. *An example of a partially closed Griffith crack*, *International Journal of Fracture Mechanics*, Vol. 5, No. 1, pp.17-24, 1969.
4. *Linear integral equations for a certain class of H-functions applicable to the theory of neutron transport and radiative transfer*, *Journal of Mathematical Physics*, Vol. 11, No. 10, pp.3091-3095, 1970. (with C.E. Siewert)
5. *Half-range expansion theorems in studies of polarized light*, *Journal of Mathematical Physics*, Vol. 11, No. 12, pp.3416-3420, 1970. (with C.E. Siewert)
6. *Matrix Riemann-Hilbert problems related to neutron transport theory*, *Nuclear Science and Engineering*, Vol.45, pp.331-332, 1971. (with C.E. Siewert)
7. *An explicit closed-form result for the discrete eigenvalue in studies of polarized light*, *Astrophysical Journal*, Vol. 173, pp.405-406, 1972. (with C.E. Siewert)
8. *Two group neutron-transport theory: Existence and uniqueness of the H-matrix*, *Journal of Nuclear Energy*, Vol. 26, pp.469-482, 1972. (with C.E. Siewert)
9. *On existence and uniqueness theorems concerning the H-matrix of radiative transfer*, *Astrophysical Journal*, Vol. 174, pp.629-641, 1972. (with C.E. Siewert)

10. *Nonlinear waves in a rate-sensitive, elastoplastic material*, International Journal of Engineering Science, Vol. 10, pp.353-367, 1972. (with T.S. Chang)
11. *On the extension of an infinite elastic plate containing an axisymmetric hole*, Journal of Applied Mechanics, Vol. 39, pp.507-512, 1972.
12. *The effect of partial closure on the stress intensity factor of a Griffith crack opened by a parabolic pressure distribution*, International Journal of Fracture Mechanics, Vol. 9, pp.9-19, 1973. (with W.Q. Gurley)
13. *An exact analytical solution of Kepler's equation*, Celestial Mechanics, Vol. 6, pp.294-304, 1972. (with C.E. Siewert)
14. *The use of Riemann problems in solving a class of transcendental equations*, Proceedings of the Cambridge Philosophical Society, Vol. 73, pp.111-118, 1973. (with C.E. Siewert)
15. *Steady-state solutions in the two group theory of neutron diffusion*, Journal of Mathematical Physics, Vol. 13, No. 10, pp.1461-1465, 1972. (with C.E. Siewert and T.W. Mullikin)
16. *Exact analytical solutions of the transcendental equation* \_\_\_\_\_, SIAM Journal of Applied Mathematics, Vol. 24, No. 4, pp.460-466, 1973.
17. *Some explicit results for the discrete spectrum basic to a model in kinetic theory*, Physics of Fluids, Vol. 16, No. 9, pp.1532-1533, 1973. (with C.E. Siewert and J.R. Thomas)
18. *Exact analytical solutions basic to a class of two body orbits*, Celestial Mechanics, Vol. 17, pp.225-235, 1973. (with C.E. Siewert)
19. *Exact analytical solutions of* \_\_\_\_\_, Journal of Mathematical Analysis and Applications, Vol. 43, No. 3, pp.626-632, 1973. (with C.E. Siewert)
20. *Solutions of the equation* \_\_\_\_\_, Journal of Mathematical Analysis and Applications, Vol. 46, No. 2, pp.329-337, 1974.(with C.E. Siewert)
21. *An exact analytical solution of* \_\_\_\_\_, Journal of Computational and Applied Mathematics, Vol. 2, No. 1, pp.19-21, 1976.(with C.E. Siewert)
22. *A note on the Riemann problems encountered in the multi-group theory of neutron diffusion*, Transport Theory and Statistical Physics, Vol. 4, No. 2, pp.49-54, 1975.
23. *Further results concerning exact analytical solutions basic to two-body orbits*, Celestial Mechanics, Vol.11, pp5-15, 1974. (with C.E. Siewert).

24. *On a critical condition*, Nuclear Science and Engineering, Vol. 52, pp.150, 1973. (with C.E. Siewert).
25. *Half-space analysis basic to the time-dependent BGK model*, Journal of Mathematical Physics, Vol.18, No.3, pp376-380, 1977. (with C.E. Siewert).
26. *On the solution of certain algebraic equations*, Journal of Computational and Applied Mathematics, Vol.4, No.1, pp. 37-39, 1978. (with C.E. Siewert).
27. *On incorporating linear constraints into H-matrix calculations*, Journal of Applied Mathematics and Physics, Vol.29, pp.846-850. 1978. (with C.E. Siewert).
28. *The H-matrix for time-dependent problems in rarefied gas dynamics*, Journal of Applied Mathematics and Physics, Vol.30, pp. 1005-1010, 1979. (with C.E. Siewert).
29. *A note on partial immobile equilibrium Griffiths cracks in two media plates*, International Journal of Engineering Science, Vol.18, pp. 153-159, 1980.
30. *An integrated first-year engineering curriculum at North Carolina State University*, Proceedings of the ASEE/IEEE Frontiers in Education Conference, pp.4d4.8-4d4.11, 1995. (with Richard Felder).
31. *Team teaching in an integrated freshman engineering curriculum*, Proceedings of the 1996 ASEE Conference and Exposition, 1996. (with Richard Felder).
32. *IMPEC: An integrated first-year engineering curriculum*, Proceedings of the 1996 ASEE Conference and Exposition, 1996. (with Richard Felder).