Dr. Gaylen Aubrey Thurston (1929-2014)

1969 – 1975 University of Denver
1979 – 1991 NASA Langley Research Center

Brief Biography:

Gaylen A. Thurston earned a B.S. in Civil Engineering at Iowa State (1950), an M.S. in Engineering at Ohio State (1951), and a Ph.D. in Engineering Mechanics at Cornell (1956). He worked in the aerospace industry (1956-1969), taught engineering mechanics at the University of Denver (1969-1975) and worked at the NASA Langley Research Center (1979-1991). He performed mathematical and numerical analyses for the design of thin shells, and he incorporated these into computer codes used in the aerospace industry.

Selected Publications:

Thurston, G. A., 1961. A Numerical solution of the nonlinear equations for axisymmetric bending of shallow spherical shells. J. Appl. Mech. 28:557-562.

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C.C. Rankin and F.A. Brogan, Application of the **Thurston bifurcation solution** strategy to problems with modal interaction, Proc. AIAA (April 1988) No. 88-2286.

Thurston, G. A., "Application of Newton's Method to Postbuckling of Rings Under Pressure Loadings," NASA TP 2941, 1989.

Gaylen A. Thurston (NASA Langley Research Center, Hampton, Virginia), "Modal interaction in postbuckled plates: theory", NASA Technical Paper 2943, 1989

Gaylen A. Thurston, "Numerical integration of asymptotic solutions of ordinary differential equations", http://purl.access.gpo.gov/GPO/LPS105798 , NASA Technical Memorandum 100650, 1989

Thurston, Gaylen A. and Sistia, Rajaram (NASA Langley Research Center, Hampton, Virginia), "Elimination of Gibbs' phenomena from error analysis of finite element results", AIAA Paper 90-0932, AIAA Structures, Structural Dynamics and Materials Meeting, April 2-4, 1990
Sistia, Rajaram and Thurston, Gaylen A. (NASA Langley Research Center, Hampton, Virginia), "An improved error analysis of finite element solutions for postbuckled plates", AIAA Paper 91-1003, AIAA Structures, Structural Dynamics and Materials Meeting, April 8-10, 1991
ABSTRACT: The accurate calculation of stresses at boundaries and interfaces where FEM analysis may be unreliable is presently undertaken by an error analysis that derives a continuous approximation to discrete finite-element data, which can be differentiated to compute continuous stresses for component-failure predictions. An evaluation is conducted of this approximation in the context of the nonlinear PDEs. A novel interpolation formula which is a simple modification of the double Fourier sine series is used to reduce truncation errors near the rectangular plate boundary by means of an 'extended grid'. Results are presented from a FEM solution, a conventional double-Fourier series' continuous approximation, and a solution applying interpolation on the extended grid, which yields superior convergence properties near the plate boundaries.