



Professor Lloyd Hamilton Donnell (1895 – 1997)

Mechanical engineer Lloyd H. Donnell is most remembered for his stress-analysis research into cylindrical shells, which advanced development of monocoque bodies for automobiles and planes. He also studied dynamics, elasticity, instability, and wave propagation. Early in his career he designed lighter-than-air ships for Goodyear Zeppelin Company, and he was a founding editor of the engineering journal Applied Mechanics Reviews.

Education:

BME Michigan 1915

Ph.D Michigan 1930 (under Timoshenko)

Career:

Teacher: Engineering, University of Michigan

Gugenheim Aeronautical Laboratory 1930-1933 (under von Karman)

Goodyear Zeppelin Company 1933-1939

Illinois Institute of Technology 1939-1962

University of Houston 1974

Teacher: Mechanical Engineering, Stanford University

Most known for: Donnell thin shell theory

Honors:

ASME Wooster Reed Warner Medal, 1960

Von Karman Medal in Engineering Mechanics, ASCE, 1968

Honorary Doctor of Laws, IIT, 1968

ASME Medal 1969

Author of book:

Beams, Plates, and Shells, McGraw-Hill, 1976 (Engineering Societies Monographs Series)

Significant Buckling Publications:

Beams, Plates, and Shells, McGraw-Hill, 1976 (Engineering Societies Monographs Series)

Stability of Thin-Walled Tubes under Torsion, NACA Report 479, National Advisory Committee on Aeronautics, Washington, D. C.

A New Theory for the Buckling of Thin Cylinders Under Axial Compression, Transactions of the American Society of Mechanical Engineers, Volume 56, November 1934, pp. 795—806.

L.H. Donnell and C. C. Wan, Effect of Imperfections on Buckling of Thin Cylinders and Columns Under Axial Compression, Journal of Applied Mechanics, Volume 17, March 1950, pp. 73—83.

Effect of Imperfections on Buckling of Thin Cylinders Under External Pressure, Journal of Applied Mechanics, Volume 23, Number 4, December 1956, pp. 569—575.

Effect of Imperfections on Buckling of Thin Cylinders with Fixed Edges Under External Pressure, Proceedings of the 3rd U. S. National Congress of Applied Mechanics, 11-14 June 1958, Providence, Rhode Island, American Society of Mechanical Engineers, New York, pp. 305--311.

1967 Symposium held in honor of Donnell:

PROCEEDINGS - SYMPOSIUM ON THE THEORY OF SHELLS TO HONOR LLOYD HAMILTON DONNELL, edited by Douglas Muster, 1967, DTIC Accession Number: AD0673610, 446 pages

Contents: Computer analysis of shells; A theory of deformable surface and elastic shell theory; Symmetrical deformations of circular cylindrical shells of rapidly varying thickness; Nonlinear membrane problems for elastic shells of revolution; Mechanics of inflatable sandwich-type shallow shells; Buckling and postbuckling of an axially compressed oval cylindrical shell; General equations of elastic stability for thin shells; A second approximation to the problem of elastic instability; Some recent research on the vibrations of elastic shells containing liquids; Forced motions of shells and plates surrounded by an acoustic fluid; The in-vacuo vibrations of a simply supported, ring-stiffened, mass-loaded cylindrical shell; Inelastic buckling of columns in the conventional testing machine; Buckling of an elastic isotropic cylindrical shell subjected to wind pressure; On the postbuckling behavior of thin-walled, axially compressed circular cylinders of finite length.