Professor Dr.-Ing. Huba Öry (1927 – 2015)

See:
http://www.patentbuddy.com/Inventor/Ory-Huba/3793412

Dept of lightweight structures
RWTH Aachen, Germany

Research Interests:
Light weight structures, vibrations, light weight structural mechanics, structural mechanics, design principles of space craft, production technology of non-metallic composite material elements, torsion, vibration strength, fatigue strength, finite element method in light weight construction, aero-elastics, composite materials

Adresse
Rheinisch-Westfälische Technische Hochschule Aachen Fakultät für Maschinenwesen Lehrstuhl und Institut für Leichtbau

Selected Publications:

Ren Wenmin (1), Liu Wenguo (1), Zhang Wei (1), H. G. Reimerdes (2) and H. Oery (2)
(1) Department of Engineering Mechanics, Tsinghua University, Beijing 100084, China)
(2) Institute of Lichtstructure, RWTH Aachen, D-52062, Aachen, Germany
"A survey of works on the theory of toroidal shells and curved tubes", Acta Mechanica Sinica, Vol. 15, No. 3, 1999, pp. 225-234, doi: 10.1007/BF02486150
ABSTRACT: This paper gives a survey of works on the theory of toroidal shells which were done by our two universities in recent years. (49 references)

Öry, H., Reimerdes, H.-G. and García, J. G. (Department of Aerospace Structures: Lightweight Construction, Institut für Leichtbau, RWTH Aachen, Wüllnerstraße 7, 52062 Aachen, Germany), "The design of shells and tanks in the aerospace industry: some practical aspects", Progress in Structural Engineering and Materials, Vol. 1, No. 4, July 1998, pp. 404–414. doi: 10.1002/pse.2260010409

J. Albus, J. Gomez-Garcia, and H. Oery, Control of Assembly Induced Stresses and Deformations due to Waviness of the Interface Flanges of the ESC-A Upper Stage, 52nd International Astronautical Congress, 1-5 Oct 2001, Toulouse, France

Öry H., Reimerdes H.-G., Gómes Garcia J., 1998, The design of shells and tanks in the aerospace industry: some practical aspects, Progress in Structural Eng. and Materials, 1, 4, 404-414

Andreas Rittweger and H. Öry (Institut für Leichtbau, RWTH Aachen, Germany), "Stability-analysis of elastic shells of revolution with the transfer-matrix-method – a fast and reliable approach based on the exact solution of the shell equations", in Buckling of shell structures, on land, in the sea, and in the air, edited by J. F. Jullien, Spon Press, 1991, ISBN 1-85166-716-4
PARTIAL INTRODUCTION: …The partial differential equation system of an axisymmetric shell with arbitrary meridian has been developed based on a complete and consistent second order theory using the normal hypothesis. Provided that the displacements are small and the material linear elastic, the second order theory is in many cases a good tool for stability analysis. By developing the physical states in the circumferential direction in a Fourier-series it is possible to eliminate the circumferential coordinate. This way the partial differential equations are transformed into an ordinary differential equation system of first order in meridional direction. In the case of axisymmetric prestress the equations of each wave-number can be evaluated

separately….

Andreas Rittweger (1), Susanne Christianson (1) and H. Öry (2)
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"Dimensioning of Orthotropic Stiffened CFRP Shells of Large Launch Vehicle for Load Introduction and Stability", (publisher and date not given in the pdf file; latest reference is 1991)
ABSTRACT: The dimensioning of an ortotropic stiffened cylindrical CFRP shell subjected to load introduction of concentrated axial loads using rapid analytical methods is presented. The dimensioning considers required constrains in the force flux distribution, strength of the laminate, general instability, panel instability (from ring frame to ring frame) and local instability. The rapid analytical methods allow for mass optimization. The final design is confirmed by detailed FE analysis. A comparison of the FE analysis with the analytical results is shown.

A. Rittweger, Th. Schermann, H. -G. Reimerdes and H. Öry (Institut für Leichtbau, Technical University Aachen, Wüllnerstr, 7, 52062, Aachen, Germany), "Influence of geometric imperfections on the load capacity of orthotropic stiffened and composite shells of revolution with arbitrary meridians and boundary conditions", Thin-Walled Structures, Vol. 23, Nos. 1-4, 1995, pp. 237-254, Special Issue: Buckling Strength of Imperfection-sensitive Shells, doi:10.1016/0263-8231(95)00014-5
ABSTRACT: A stiffness matrix for an element of a shell of revolution has been derived, considering arbitrary load distributions and initial geometric imperfections. This element-stiffness matrix is based on the transfer-matrix method and describes the whole section of a shell of revolution between two rings in modal coordinates (a so-called super-element). The modal coordinates here are circumferential Fourier members, thus reducing the partial differential equations to ordinary ones. Several stability analyses investigating the sensitivity of composite shells to different geometric imperfection shapes were carried out. The influence of the load distribution and boundary conditions in combination with geometric imperfections was analysed by different modellings of a hypothetical Jupe Avant shell of the ARIANE 5 rocket.

Öry, H., Reimerdes, H.-G. and García, J. G. (Department of Aerospace Structures: Lightweight Construction, Institut für Leichtbau, RWTH Aachen, Wüllnerstraße 7, 52062 Aachen, Germany), "The design of shells and tanks in the aerospace industry: some practical aspects", Progress in Structural Engineering and Materials, Vol. 1, No. 4, July 1998, pp. 404–414. doi: 10.1002/pse.2260010409
ABSTRACT: This review highlights some practical aspects of the design of thin-walled shells for aerospace applications. This type of shell must comply with the mission profile. It is therefore necessary to find an optimum structural concept with low weight, high strength, high buckling load and a low imperfection sensitivity. In an optimum design, structural instability occurs slightly below the material strength or yield strength. In general, and by contrast with other structural elements such as beam and plates, a thin-walled cylindrical shell shows a high imperfection sensitivity. Hence, recommendations are given concerning the design of shells and approximate stability analyses are presented for different mechanical loading conditions.

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(1) Institut für Leichtbau, Aachen University of Technology (RWTH Aachen), Germany
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"Imperfection sensitivity of an orthotropic spherical shell under external pressure", International Journal of

Non-Linear Mechanics, Vol. 37, Nos. 4-5, June 2002, pp. 669-686, Special Issue: Stability & Vibration in Thin-Walled Structures, doi:10.1016/S0020-7462(01)00091-9
ABSTRACT: In the first part of this paper, rib-stiffened thin-walled spherical shells under external hydrostatic pressure are optimized using classical approximate methods and empirical knock-down-factors. In the second part of the paper, the influence of known imperfections is investigated. The thin-walled spherical shells under external pressure are very sensitive to geometrical imperfections. Hoff recognized that for entire isotropic spherical shells the more likely imperfection will be a local circular dent, which for such shells, can always be considered as an axisymmetric one. Hoff's idea has been further investigated by Koga–Hoff, Galletly et al. These results showed that for a given depth of an imperfection a critical size of the corresponding circular dent exists, giving the minimum for the actual load carrying capacity of the shell. This paper suggests to extend Hoff's theory to isogrid and waffle-grid stiffened spherical shells. The issue of these investigations is a set of knock-down-factors plotted versus imperfection amplitude related to the total thickness of the rib-stiffened (isogrid or waffle-grid) shell. These curves fit reasonably with those established for isotropic shells by Hoff et al. or by Koiter, and enable to estimate the jeopardy of measured actual dents.