Professor David Hui

See:
http://myweb.polyu.edu.hk/~mmktlau/ICCE/ICCE_Main.htm
http://coe.uno.edu/me/faculty.htm
http://www.journals.elsevier.com/composites-part-b-engineering/editorial-board/david-hui/
http://saa.zju.edu.cn/english/news.php?id=4718
http://www.sagepub.com/editorDetails.nav?contribId=629993
http://0-www.worldcat.org.novacat.nova.edu/identities/lccn-n86-117448

Director of Composite Material Research Laboratory
Department of Mechanical Engineering
University of New Orleans

Education:
Ph.D., University of Toronto
MS, Massachusetts Institute of Technology

Research Interests:
Composite materials
Structural dynamics
Vibration and buckling of plates and shells
Ice mechanics
Plasticity

Current Research:
Buckling and vibration of laminated plates and shells
Impact behavior of laminated imperfect flat of cylindrical panels under axial impact
Constitutive equations for engineering materials (including floating ice plates)

Honorary Degrees:
Kherson National Technical University, Ukraine Doctor Honoris Causa, Oct. 2004, awarded by rector Y.N. Bardachov
Vietnamese Academy of Science and Technology, Doctor Honoris Causa, Jan 2007, awarded by president Dang Vu Minh
University of Salerno, Italy, Doctor Honoris Causa, Nov, 2008, awarded by rector Raimondo Pasquino

Honorary Professor:
Saigon Technology University, Vietnam
Harbin Inst of Tech
Shaanxi Univ of Sci and Tech
Yunnan Univ.
Shenyang Univ.of Chemical Technology
Chongqing Univ.
Hebei Univ of Engineering
Henan Univ of Sci and Tech
Guizhou Univ.
Kunming Univ of Sci and Tech

Shanghai Univ.
Xi’an Technological U.

Visiting Professor:
Southeast Univ., Nanjing
Huazhong Univ. Sci Tech., Wuhan
Tongji Univ., Shanghai
Fudan Univ., Shanghai
Guangdong Univ of Tech.
Shantou Univ.
Shanghai Jiaotong Univ.
Jinan Univ.

To be awarded Hon. Profesorships:
Dalian Univ of Tech., China,
Hubei Univ.(Wuhan)
Ningbo University

Dr. David Hui is Professor of Mechanical Engineering and director of Composites Materials Research Laboratory at University of New Orleans. He received his Ph.D. from University of Toronto in Aerospace Engineering. Dr. Hui has edited over 35 widely cited books, as evidence in the Google Search showing over 14000 citations. Other books includes, editor of Army Research Office workshop "Dynamics of Structures" proceedings, ICCE/1-19, SES, ASME books and numerous special issues of journals, and served as numerous keynote lecturers. He has served as founder and editor-in-chief of one of the most prestigious journals in composite materials, Composites B Engineering journal. This journal has consistently ranked second or third among all composite materials journals in terms of impact factors. Curently, he serves on the editorial board of 41 international journals, seven of them are nano journals, and the rest are mostly composite materials journals.

Dr. Hui is currently ASME Fellow, ICCE Life Member, AIAA Associate Fellow and CASI Associate Fellow. Dr. Hui was awarded The Ohio State University Research Award, ASME Pressure Vessels and Piping Certificate of recognition, ASME Ralph James Award (ASME Petroleum Division), NASA Certificates of Recognition, ASME ETCE Service Awards, the University of New Orleans Alumni (lifetime) Career Research Achievement Award and the University of New Orleans, University Research Professor. Dr. Hui is the chairman of ICCE, which has grown to be the world's pre-eminent annual "technical" composite materials or nano-materials conference.

Dr. Hui has conducted funded research on composites materials and nano-materials, mostly for mechanical/aerospace engineering and ship structures applications. He is widely known for his research on (i) nano materials mechanical properties modeling and prototyping (ii) mechanical behavior of materials under high or low temperatures, flammability and creep of composite materials, including smart material and structures, (iii) impact of blast dynamics, micro-crack initiation and growth under thermal and mechanical loadings and (iv) infrastructure composites under harsh environments. Dr. Hui has co-authored approximately 300 technical publications, and received over 100 citations per year on his journal publications according to ISI. One of his outstanding contributions in research lies in the modeling of penetration of composite materials using the energy partition model and the validation of universal scaling laws, resulting in cost savings and durability of structures. He has made significant contributions on postbuckling behavior of imperfect thin walled structures.

Dr. Hui was the recipient of research grants from NASA, ARO, ONR, AFOSR, NSF, LEQSF, US Army CRREL, GCRMTC, NOAA, Wright Patterson AFB, Universal Energy, Avondale Shipbuilding Inc., Northrup Grumman Ship Systems, among others. In recent years, Dr. Hui presented numerous keynote lectures: NATO conference Kiev (Ukraine) 1997, NATO conference Troia (Portugal) 1998, ICCE Orlando 1999, IMEKO Vienna 2000, 32nd National Conference of the Italian Association for Stress Analysis, and at Composites Review, Carlos III University, Madrid 1998, 2002, and Nano Thailand in 2007, NATO conference Ukraine 2009, MATCOMP'11 Barcelona, 2011, Textile Conference, Liberec Czech Rep., 2011. He is successful in promoting federally funded multi-universities partnerships on nano-materials or composite or nano materials.

Selected Publications:

Hui, D. and J.S. Hansen (1980) The swallowtail and butterfly cuspoids and their application in the initial post buckling of single mode structural systems. Quarterly of Applied Mechanics, April, p. 17-35.

Hui, D. (1983). Large-Amplitude Axisymmetric Vibrations of Geometrically Imperfect Circular Plates. Journal of Sound and Vibration, 91(2):239–246.

Hui, D. (1983). Large-Amplitude Vibrations of Geometrically Imperfect Shallow Spherical Shells with Structural Damping. AIAA Journal, 21(12):1736–1741.

Hui, D. (1984). Influence of Geometric Imperfections and In-Plane Constraints on the Nonlinear Vibrations of Simply Supported Cylindrical Panels. Journal of Applied Mechanics, 51:383–389.

D. Hui and I.H.Y. Du, Initial postbuckling behavior of imperfect, antisymmetric crossply cylindrical shells under torsion, J. Appl. Mech. 54 (1987) 174-180.

David Hui (Department of Engineering Mechanics, Boyd Laboratory, 155 West Woodruff Avenue, Columbus, OH 43210-1181, U.S.A.), "Imperfection sensitivity of axially compressed laminated flat plates due to bending-stretching coupling", International Journal of Solids and Structures, Vol. 22, No. 1, 1986, pp. 13-22, doi:10.1016/0020-7683(86)90100-9
ABSTRACT: This paper investigates the effects of the bending-stretching coupling on the imperfection sensitivity of axialty compressed laminated, thin, rectangular flat plates. In particular, it is found that under certain circumstances this coupling phenomenom results in a nonzero cubic term of the potential energy, so that the structure may be imperfection sensitive depending on the sign of the imperfection. The analysis considers a nonlinear prebuckling state due to bending-stretching coupling of the structure. The buckling and initial postbuckling problem is solved using Koiter's theory of elastic stability.

David Hui and Arthur W. Leissa (Department of Engineering Mechanics, The Ohio State University, Columbus, OH 43210, U.S.A.), "Effects of uni-directional geometric imperfections on vibrations of pressurized shallow spherical shells", International Journal of Non-Linear Mechanics, Vol. 18, No. 4, 1983, pp. 279-285, doi:10.1016/0020-7462(83)90024-0
ABSTRACT: This paper deals with the effects of initial geometric uni-directional imperfections on vibrations of a pressurized spherical shell or spherical cap. The analysis is based upon shallow shell theory. Frequency vs

applied pressure interaction curves are plotted for various values of the imperfection amplitude. Imperfections are shown to have a severe effect in reducing the natural frequencies similar to that demonstrated in the buckling behavior of spherical shells.

David Hui (Department of Engineering Mechanics, The Ohio State University, Columbus, Ohio 43210, U.S.A.), “Amplitude modulation theory and its application to two-mode buckling problems”, Zeitschrift für Angewandte Mathematik und Physik (ZAMP), Vol. 35, No. 6, November 1985, pp. 789-802, doi: 10.1007/BF00944894
ABSTRACT: This paper aims to review Koiter’s theory of amplitude modulation of the local mode and present it in a form suitable for general application. Various features of this theory are compared with Koiter’s general theory of 1945. The amplitude modulation theory is applied to two-mode buckling of stringer stiffened cylindrical shells under axial compression. New mode interaction results are reported involving the simultaneous local and overall buckling in which the local mode is postbuckling unstable.

David Hui (Department of Engineering Mechanics, The Ohio State University, Columbus, Ohio 43210, U.S.A.), “Soft-spring nonlinear vibrations of antisymmetrically laminated rectangular plates”, International Journal of Mechanical Sciences, Vol. 27, No. 6, 1985, pp. 397-408, doi:10.1016/0020-7403(85)90030-X
ABSTRACT: This paper deals with the effects of initial geometric imperfections and in-plane boundary conditions on the large-amplitude vibration behavior of angle- and cross-ply rectangular thin plates. It is found that the presence of imperfection amplitudes of the order of only half the total laminated-plate thickness may significantly raise the vibration frequencies and change the large-amplitude vibration behavior from the well-known hard-spring to soft-spring behavior. The effects of fibre angles and bending-stretching coupling for angle-ply plates and Young's moduli ratios and number of layers for antisymmetric cross-ply plates are examined.

David Hui (The Ohio State University, Department of Engineering Mechanics, Boyd Laboratory, 155 W. Woodruff Ave., Columbus, Ohio 43210, USA), “Asymmetric postbuckling of symmetrically laminated cross ply, short cylindrical panels under compression”, Composite Structures, Vol. 3, No. 1, 1985, pp. 81-95, doi:10.1016/0263-8223(85)90029-7
ABSTRACT: Buckling and initial postbuckling behavior of symmetrically laminated, thin cross ply cylindrical panels under axial compression are investigated. The panels are simply supported at all four edges. Closed form solutions are obtained for the buckling loads. The initial asymmetric postbuckling behavior is demonstrated by computing the postbuckling coefficients within the context of Koiter's theory of elastic stability. Parameter studies involving the flatness parameter, the length-to-width ratio, number of layers and Young's moduli ratio are presented for typical cross ply cylindrical panels likely to be encountered in practice.

D. Hui, “Imperfection-Sensitivity of Elastically Supported Beams and Its Relation to the Double-Cusp Instability Model”, Proc. R. Soc. Lond. A 8 May 1986, vol. 405, no. 1828, pp. 143-158, doi: 10.1098/rspa.1986.0046
ABSTRACT: This paper deals with the two-mode initial postbuckling analysis of geometrically imperfect beams on elastic foundation under compression. By adjusting the beam length to the characteristic length ratio, it is found that the resulting two-mode stability problem may be classified as the double-cusp model in catastrophe theory. The appropriate postbuckling coefficients are computed with the use of Koiter's theory of elastic stability. The equilibrium paths and the critical sets are plotted and analysed. Eight independent control parameters are suggested. The paper is the first in the open literature to apply the double-cusp model to a two-mode stability problem which displays imperfection-sensitivity.

David Hui and Y.H. Chen (Department of Engineering Mechanics, Ohio State University, Columbus, OH 43210, U.S.A.), “Imperfection-sensitivity of cylindrical panels under compression using Koiter's improved postbuckling theory”, International Journal of Solids and Structures, Vol. 23, No. 7, 1987, pp. 969-982, doi:10.1016/0020-7683(87)90090-4
ABSTRACT: This paper deals with the use of Koiter's improved postbuckling theory in axial buckling of integrally stiffened cylindrical panels. According to Koiter's improved theory, the postbuckling coefficients are evaluated at the actual applied load rather than at the classical buckling load. Substantial positive shift of the postbuckling is found which indicates that the imperfectionsensitivity predicted by Koiter's 1945 general theory may significantly overestimate the degrading effects of these imperfections. Such a positive shift is especially crucial in studying mode interactions such as local and overall buckling mode interactions of stringer-reinforced cylindrical shells.

David Hui (The Ohio State University, Dept of Engineering Mechanics, Columbus, OH 43210, U.S.A.), “Postbuckling behavior of infinite beams on elastic foundations using Koiter's improved theory”, International Journal of Non-Linear Mechanics, Vol. 23, No. 2, 1988, pp. 113-123, doi:10.1016/0020-7462(88)90018-2
ABSTRACT: This study deals with the postbuckling behavior of infinite beams on non-linear elastic foundations subjected to axial compression. The analysis utilizes an improved Koiter's postbuckling theory such that the postbuckling coefficients are evaluated at the actual applied load rather than at the classical buckling load. The improved postbuckling paths are found to agree well with the non-linear large deflection solution using the Ritz procedure. This paper substantiates Koiter's conjecture that the general theory of elastic stability may be improved. The implications of various lower-bound buckling loads are examined.

David Hui (Department of Mechanical Engineering, University of New Orleans, Lake Front, New Orleans, LA 70148, U.S.A.), “Effects of shear loads on vibration and buckling of antisymmetric cross-ply cylindrical panels”, International Journal of Non-Linear Mechanics, Vol. 23, No. 3, 1988, pp. 177-187, doi:10.1016/0020-7462(88)90010-8
ABSTRACT: This work deals with the effects of shear loads on the vibration and buckling of typical antisymmetric cross-ply thin cylindrical panels, subjected to combined loads. Changes in the buckling loads due to geometric and material parameter variations are investigated with particular emphasis on distinguishing the symmetric and antisymmetric modes. The paper presents the first known results on shear buckling of cross-ply cylindrical panels as well as vibrations of these structures under shear loads. The resulting interaction curves will allow one to formulate effectively a preliminary design of these panels which will withstand shear loads.

Piyush K. Dutta, David Hui and Yvone M. Traynham (U.S. Army Corps of Engineers: Cold Regions Research and Engineering Lab, Hanover, NH USA), “Buckling of Unidirectional Graphite/Epoxy Composite Plates at Low Temperatures”, Special report 91-20, November, 1991, Accession Number: ADA246602, Handle / proxy Url : http://handle.dtic.mil/100.2/ADA246602
ABSTRACT: A theoretical and experimental study of the buckling and postbuckling behavior of unidirectionally laminated graphite/epoxy plates was conducted under combined thermal cooling and compressive loading. The rectangular plates were simply supported at the loaded edges and free in the remaining edges. The plates were found to bend during cooling even without mechanical loads because of the negative thermal expansion coefficient of the material in the loading direction and the in-plane end constraints at the two-loaded edges. Such bending from thermal load was treated as an initial geometric imperfection, and the analysis was based on Koiter's theory of elastic stability. The experimental postbuckling curves agreed well with the theoretical values.