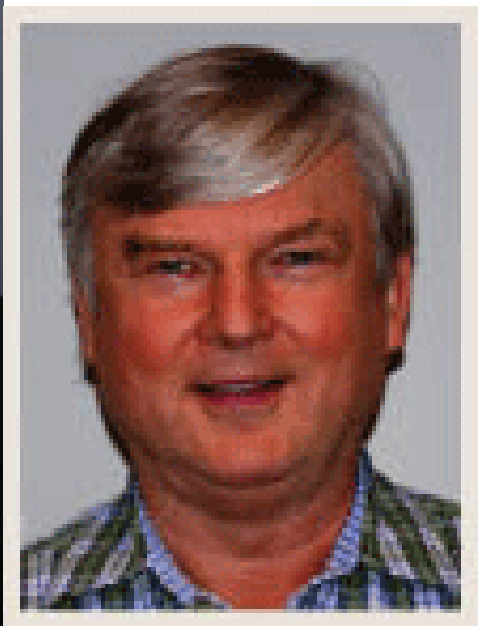

Professor Alexander E. Bogdanovich

See:
http://www.tx.ncsu.edu/about/find-people/people-detail.cfm?id=660
http://www.engr.ncsu.edu/faculty/new-faculty/bogdanovich2011.php
http://www.bookfinder.com/author/alexander-bogdanovich/
http://0-www.worldcat.org.novacat.nova.edu/identities/lccn-n91-31882

Biography:
Bogdanovich received his MS in physics from Latvian State University in Riga, Latvia, in 1972 and his PhD in solid mechanics from the Latvian Academy of Sciences, also in Riga, in 1975. Prior to his present employment with NC State, which began in July 2011, Bogdanovich was vice president for research and development at 3TEX, Inc., which is located in Cary, NC. He held this position from 1998 to 2011. Bogdanovich was a senior research scientist in AdTech Systems Research, Inc. in Dayton, Ohio, from 1995 to 1998 and a research

associate professor with NC State from 1991 to 1995. He also held positions of increasing responsibility at the Institute of Polymer Mechanics at the Latvian Academy of Sciences. He was a junior research scientist from 1975 to 1978, a senior research scientist from 1978 to 1986, and a deputy director for research from 1986 to 1990.

Bogdanovich has received numerous awards and recognition for his research work. He placed first in the Outstanding Paper Awards category at the Society for the Advancement of Material and Process Engineering conferences in 2003 and 2006 and received the Friedrich Tsander Memorial Award for Best Research in Physico-Mathematical and Technical Sciences from the Latvian Academy of Sciences in 1987.

Presently he studies three-dimensional fabric preforms and their composites and carbon nanotube textiles and their composites. He also develops and applies multi-scale computational modeling and 3D analysis methods for predicting static, dynamic, damage and fracture properties and the behavior of composite materials and structures.

Research Interests:
Solid Mechanics, Mechanics of Composite Materials, Computational Mechanics and Finite Element Analysis, Theory of Plates and Shells, Textile Composites, Nanocomposites, 3-D Weaving and 3-D Braiding, Mechanical Characterization of Composite Materials, Probabilistic and Stochastic Meachanics, Physics and Mechanics of Polymers, Theory of Viscoelasticity, Dynamics and Stability of Composite Plates and Shells, Damage and Failure Modeling Composite Materials, Ballistics and Protective Armor Systems, Blast Modeling and Structure Response Predictions, Bonded and Bolted Joints

Education:
1967 Graduated with Gold Medal from Riga 1st High School with Physico-Mathematical Specialty, Riga, Latvia, USSR

1972 M.S. Physics, Faculty of Physics and Mathematics, Department of Electrodynamics and Mechanics of Media, Latvian State University, Riga, Latvia, USSR. An extensive 5-7ear curriculum of Physicis and Mathematics, Theoretical Physics, Solid Mechanics and Theory of Electromagnetic Fields. Thesis title "Dynamic Instability of Viscoeleastic Composite Cylindrical Shells"

1975 Candidate of Physico-Mathematical Sciences (an equivalent of Ph.D.), Solid Mechanics, from Latvian Academy of Sciences, Riga, Latvia, USSR. Dissertation: "Parametric Vibrations of Orthotropic Cylindrical Shells Having Viscoelastic Core"

1987 Doctor of Physico-Mathematical Sciences, Solid Mechanics, from the Doctoral Scientific Council at Kazan' State University, Kazan' city, Russia, USSR. Dissertation: "Deformation and Failure of Composite Cylindrical Shells under Dynamical Loading"

1998 Dr. habil. sc. ing., honorary degree from Latvian Academy of Sciences, Riga, Latvia.

Organizations:
American Institute of Aeronautics and Astronautics
American Society of Mechanical Engineers
Society for the Advancement of Material and Process Engineering

Academic Council for Reliability of Engineering Structures (USSR)
Scientific Committee on Testing and Standardization, European Association for Composite Materials

Selected Publications:

Bogdanovich, A. E. and Mohamed, M. H., "Three-dimensional reinforcements for composites." SAMPE J. 2009, Vol. 45, No. 6, 8-28.

Bogdanovich, A. E., "Multi-scale modeling, stress and failure analyses of 3-D woven composites." J. of Materials Science. 2006, Vol. 41, No. 20, 6547-6590.

Bogdanovich, A. E. and Pastore, C. M., Mechanics of Textile and Laminated Composities, Chapman & Hall, London, 1996.

Bogdanovich, A. E., Non-linear Dynamic Problems for Composite Cylindrical Shells, Elsevier, London, 1993.

A. E. Bogdanovich and É. G. Feldmane (Institute of Polymer Mechanics, Academy of Sciences of the Latvian SSR, Riga), "Calculation of the supporting capacity of composite cylindrical shells under dynamic loading", Mechanics of Composite Materials, Vol. 16, No. 3, 1980, pp. 341-349, doi: 10.1007/BF00608338
PARTIAL INTRODUCTION: A large number of both theoretical and experimental papers have been devoted to the problem of the buckling of cylindrical shells subjected to dynamic loads. The main results which have been produced up to now are reflected in the monograph [1] and the articles [2-9] (for axial compression) and [10-13] (for external pressure). However, the problem of finding the value of the dynamic load for which the limiting state is reached in a shell has been solved only in [16] from among the papers known to the authors, where the bending and stresses in a steel shell were determined in a geometrically linear formulation upon the action of an axial compressive pulse of rectangular shape…The content of a procedure developed by the authors for the solution by the Bubnov-Galerkin method of the geometrically nonlinear equations of average bending under the action of dynamic axial compression or external pressure on an orthotropic cylindrical shell is briefly outlined in this article. Examples are given of the determination of the critical loads for multilayer shells using the strnngth surfaces for composites under conditions of a plane stress state…

A.E. Bogdanovich and E.G. Feldmane (Institute of Polymer Mechanics, Academy of Sciences of the Latvian SSR, Riga), "Deformation of cylindrical composite shells under combined dynamic loading", Mechanics of Composite Materials, Vol. 17, No. 3, 1981, pp. 309-320, doi: 10.1007/BF00605072
ABSTRACT: A procedure has been shown for calculating the stress-strain state of cylindrical multilayer shells made from composite materials under the combined action of dynamic axial compression and dynamic external pressure, as well as with different variants of combined loading with static and dynamic forces. An investigation has been made of the effect on the mode of the buckled shell surface of the ratio of the application rate of dynamic loads; ranges of loading rates have been established in which stresses predominate caused either by axial compression or external pressure. It has been shown that, as a result of preliminary static loading, a marked change occurs in the initial imperfections of the shell mode which affects subsequent dynamic buckling. To calculate the time when the first defect occurs and its location in the shell body, a procedure has been devised for layer-by-layer strength analysis employing a tensor-polynomial criterion. It was demonstrated that the level of preliminary static loading noticeably affects the time until the first failure of the layer, not only a reduction of this time being possible with an increase in the static loads, but also an increase in it.

A. E. Bogdanovich and S. P. Yushanov (Institute of Polymer Mechanics, Academy of Sciences of the Latvian SSR, Riga), "Analysis of the buckling of cylindrical shells with a random field of initial imperfections under axial dynamic compression", Mechanics of Composite Materials, Vol. 17, No. 5, 1982, pp. 552-560,

doi: 10.1007/BF00605254
PARTIAL ABSTRACT: The main characteristic feature of the process of buckling of cylindrical shells acted on by both static and dynamic axial compressive loads is its high sensitivity to initial imperfections of the shape of the shell. The assumption that, among the factors which reduce the carrying capacity of a shell, deviations from an ideal cylindrical shape of the surface play a dominant role was first advanced in [1]. It subsequently received convincing confirmation in numerous experimental and theoretical investigations. Two trends have developed in the solution of the problem of static stability…

A. E. Bogdanovich and T. B. Koshkina (Institute of Polymer Mechanics, Academy of Sciences of the Latvian SSR, Riga), "Deformation and strength of orthotropic ring-stiffened cylindrical shells under dynamic compressive loads", Mechanics of Composite Materials, Vol. 19, No. 3, 1983, pp. 353-363,
doi: 10.1007/BF00604405
PARTIAL INTRODUCTION: Problem of the dynamics of stiffened cylindrical shells has attracted the diligent attention of researchers in recent years. Questions concerning the natural and induced vibrations of stiffened cylindrical shells are examined in greater detail in familiar theoretical studies (A review of these investigastions is given in [1,2]). Results obtained to date on the problem of the determination of strengthened cylindrical shells under dynamic loads are meager and are clearly inadequate for both a definitive understanding of the effect of strengthening elements on the deformation process, and also their effective use to increase the bearing capacity of designs…

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(2) North Carolina State University, Department of Textile Engineering, Chemistry and Science, Raleigh, North Carolina 27695-8301, U.S.A.
"Analytical probabilistic modeling of initial failure and reliability of laminated composite structures", International Journal of Solids and Structures, Vol. 35, Nos. 7-8, March 1998, pp. 665-685,
doi:10.1016/S0020-7683(97)00081-4
ABSTRACT: An analytical approach based on the theory of stochastic processes is developed for the stochastic initial failure analysis and reliability predictions of thin-walled laminated composite structures. The probability of initial failure is calculated using theory of rare passages of the random strain vector field out of the prescribed region of allowable states. The region is limited by the ultimate strain surfaces adopted for each individual layer in the laminate. The surfaces, in their turn, are defined in terms of the scatters in the ultimate strains for the composite layer. Reliability function of a composite layer having random elastic characteristics and loaded with random in-plane tractions is determined through the probability of its initial failure. The reliability function of the laminated composite structure is then calculated through the failure probabilities of individual layers, using the weakest link model. The proposed approach allows one to solve diverse stochastic problems and requires substantially less computational expenses than Monte Carlo simulation technique. The approach may be invaluable for a quick evaluation of various competitive design projects when considering laminated composite structures under the reliability constraint. Applications of the developed approach are illustrated on the examples of reliability predictions of laminated composite cylindrical shells under the effect of random internal pressure and laminated composite plates under random biaxial loading. Numerical results reveal specific probabilistic phenomena related to the effects of ply lay-up, scatters in mechanical and strength characteristics and random loading histories. Results obtained from the developed analytical approach are compared to those calculated with Monte Carlo simulation technique.