The Department of Mechanical Engineering/College of Engineering and Applied Sciences/State University of New York at Stony Brook presents:

The Mechanical Engineering Distinguished Lecture Series

John W. Hutchinson

Title: On the Design of Blast Resistant Plate Structures

Speaker: Dr. John W. Hutchinson, Division of Engineering and Applied Sciences, Harvard University
Date: 11:40AM, Friday, September 26, 2003, room 301 of the Engineering Building

Abstract

Can metal sandwich plate construction be more effective in resisting blast loading than solid plate structure of the same mass and material? The answer is "yes" but establishing this relative advantage requires an understanding of basic aspects of fluid-structure interaction and plastic deformation of the components (faces and core) of the sandwich plate. Core topology (e.g. honeycomb, corrugated plates or truss elements) is an important consideration in the development of effective sandwich plates, as in the relative allocation of material to the faces and core. Dissipation of energy occurs in compaction of the core and in bending and stretching of the faces. The seminar will present an overview of the mechanics underlying these issues and will review simulations of plates subject to blast loads. Relatively simple scaling laws related to the design of blast resistant sandwich plates will be given.

Biography

Dr. Hutchinson is the Gordan McKay Professor of Applied Mechanics, Division of Engineering and Applied Sciences, Harvard University Mechanics of Materials and Structures (micro and macro-mechanics: elasticity, plasticity stability) Professor Hutchinson's interests span the range from structures as large as aerospace structures and ships through the microscopic scales relevant to the deformation, fracture and processing of engineering materials. He joined the faculty of the Division of Engineering and Applied Sciences at Harvard in 1964. His current research includes activities on the development of and design with ceramic matrix composites, the extension of plasticity theory to micron scales, failure modes in multilayers, the mechanics of toughness for metal and metal/ceramic systems and riveting. He works closely with colleagues at Harvard and at other universities and industrial labs.

Awards and Honors: Irwin Medal of ASTM (1982) Prager Medal of SES (1991) Nadai Award of ASME (1991) Swedlow Award of ASTM (1993), Honorary Doctoral Degree, Royal Institute of Technology, Stockholm (1985), Honorary Doctoral Degree, Technical University of Denmark (1992), National Academy of Engineering, National Academy of Sciences.

Directions by car to the State University of New York at Stony Brook

From New York City, take the Long Island Expressway (LIE -495) eastbound from the Queens Midtown Tunnel in Manhattan or the Throgs Neck Bridge to Whitestone Bridge in Queens to exit 62 and follow Nicolls Road (route 97) north for 9 miles, the main entrance to the University is on the left. For more information, call Ann at 631 632 8300

STONY BROOK
STATE UNIVERSITY OF NEW YORK