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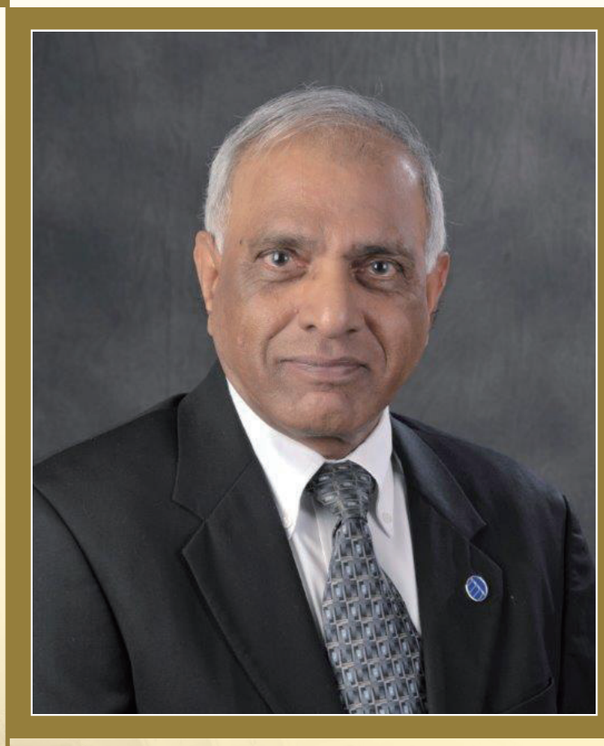
City University Distinguished Lecture Series

Speaker

Professor J.N. Reddy

Oscar S Wyatt Endowed Chair Professor
Distinguished Professor
Regents' Professor of Mechanical Engineering
Texas A&M University



Journey through Mechanics Research: A Personal Retrospective

on

Friday, 12 October 2018 at 11:00 am

at

Connie Fan Multi-media Conference Room
4/F Cheng Yick-chi Building
City University of Hong Kong
Tat Chee Avenue, Kowloon

Abstract

This is a personal retrospective of the author's journey through mechanics research and education. The publication of a seminal paper on 14 primal and dual variational principles of mechanics and two books on mathematical theory of finite elements and variational principles in theoretical mechanics with Professor J.T. Oden and introduction to composite materials by Professor C.W. Bert provided the inspiration and paved the way for the author's professional journey through composite materials and structures, higher-order shell finite elements, and non-local continuum theories, and penalty and least-squares finite elements models of fluid flow. The lecture will begin with an overview of the author's highly-cited shear deformation and layerwise theories for composite laminates, the least-squares finite element models of the flows of viscous incompressible fluids, and a robust shell finite element. Then overview of the author's recent research on nonlocal elasticity and couple stress theories in formulating the governing equations of functionally graded material beams and plates will be presented. In addition, the graph-based finite element framework (GraFEA) suitable for the study of damage in brittle materials will be discussed.

Biography

Professor Reddy, the Oscar S Wyatt Endowed Chair Professor, Distinguished Professor, and Regents' Professor of Mechanical Engineering at Texas A&M University, is a highly-cited researcher, author of 21 textbooks and over 620 journal papers, and a leader in the applied mechanics field for more than 40 years.

Reddy is known worldwide for his significant contributions to the field of applied mechanics through the authorship of widely used textbooks on the linear and nonlinear finite element analysis, variational methods, composite materials and structures, and continuum mechanics. His pioneering works on the development of shear deformation theories (that bear his name in the literature as the *Reddy third-order plate theory* and the *Reddy layerwise theory*) have had a major impact and have led to new research developments and applications. Some of the ideas on shear deformation theories and penalty finite element models of fluid flows have been implemented into commercial finite element computer programs like ABAQUS, NISA, and HyperXtrude.

Current research of Professor Reddy deals with 7- and 12-parameter shell theories, nonlocal and non-classical continuum mechanics problems, and problems involving couple stresses (i,e, the development of nonlocal beam and plate theories using the ideas of Eringen, Mindlin, Koiter, and others), surface stress effects, discrete fracture and flow, micropolar cohesive damage, and continuum plasticity of metals from considerations of non-equilibrium thermodynamics–as they appear in blood flow, bones, and materials with hard inclusions and phases.

Recent Honors include: 2016 *Prager Medal*, Society of Engineering Science, 2016 Thomson Reuters IP and Science's Web of Science Highly Cited Researchers –*Most Influential Minds*, the 2016 *ASME Medal* from the American Society of Mechanical Engineers, the 2017 *John von Neumann Medal* from the US Association of Computational Mechanics, and the 2017 Theodore von Karman Medal from the American Society of Civil Engineers. He is a member US National Academy of Engineering and foreign fellow of Indian National Academy of Engineering, the Canadian Academy of Engineering, and the Brazilian National Academy of Engineering. A more complete resume with links to journal papers can be found at http://mechanics.tamu.edu

Online registration:
http://www.cityu.edu.hk/vprt/cityu-dls/upcoming.htm

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