Joint CityU ACE/HKSTAM Distinguished Seminar

Nonclassical Structural Theories of Beams and Plates with Nonlocal and Strain Gradient Effects

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Date: **17 July 2014 (Thursday)**
Time: **15:30-16:30**
Co-organizers: Department of Architecture and Civil Engineering (ACE), City University of Hong Kong, and Hong Kong Society of Theoretical and Applied Mechanics (HKSTAM)
Venue: P4704 (Academic 1 building, purple zone, level 4), City University of Hong Kong
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Abstract

The objective of this lecture is to present an overview of the authors' recent research on nonlocal elasticity and modified couple stress/strain gradient theories in formulating the governing equations of functionally graded material beams and plates. In addition to Eringen's nonlocal elasticity, two different nonlinear gradient elasticity theories that account for (a) geometric nonlinearity and (b) microstructure-dependent size effects are revisited to establish the connection between the two theories. The first theory is based on modified couple stress theory of Mindlin and Yang et al. and the second one is based on Srinivasa-Reddy gradient elasticity theory. The modified couple stress theory includes a material length scale parameter that can capture the size effect in a material. The Srinivasa-Reddy theory contains, as a special case, the first one. These two theories are used to derive the governing equations of beams and plates.

Biography of Speaker

Junuthula N. Reddy is a Distinguished Professor, Regents' Professor and inaugural holder of the Oscar S. Wyatt Endowed Chair in Mechanical Engineering at Texas A&M University, College Station, Texas, USA. He is one of the researchers responsible for the development of the Finite Element Method (FEM). He is an authoritative figure in the broad area of mechanics. He has made significant seminal contributions in the specific areas of finite element method, plate theory, solid mechanics, variational methods, mechanics of composites, functionally graded materials, fracture mechanics, plasticity, biomechanics, classical and non-Newtonian fluid mechanics, and applied functional analysis. Reddy has over 480 journal papers, 18 books (with several second and third editions), and has given numerous national and international talks. He has advised around 23 postdoctoral fellows,

55 Ph.D. students, and 43 M.S students over 35 years. Many of his (former) PhD and postdoctoral students are currently faculty members in reputed universities throughout the world. He has been listed as an ISI Highly Cited Author in Engineering by the ISI Web of Knowledge, Thomson Scientific Company. Reddy is one select researchers across world in engineering to be recognized by ISI Highly Cited Researchers with over 10,000 citations (a h-index of over 50 as per Web of Science / h-index of 60 as per Google Scholar). In addition to being a world class researcher, he is also renowned as an educator. He has won many teaching awards, and his books are widely used as textbooks in many courses at various universities across the world. His books are known for explaining very difficult theories in lucid manner.

Venue Location Map