The Department of Mechanical Engineering/College of Engineering and Applied Sciences
Stony Brook University (SUNY at Stony Brook)

Mechanical Engineering Distinguished Lecture

Dr. C.T. Sun
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Lecture Title: Behavior and Modeling of Nanocomposites

Friday, November 30, 2007, 2:00PM, Room 301 Engineering Building

Abstract

In recent years, as various nanomaterials have been developed with advancement in nanoscience and nanotechnology, applications of nanomaterials to form nanocomposite materials have attracted attention of many researchers. The increased specific surface area is one of the nano scale effects that makes nanomaterials significantly distinct from the corresponding bulk materials. Nanoparticles are now added in polymer matrices as fillers/reinforcements in order to take advantage of increased reactive surface area to molecules in polymeric materials. The mechanical properties of particulate composites are mainly dependent on the volume fraction, the size of the particle, and the interfacial properties between particles and the polymeric matrix. In this talk, the attention is focused on the challenges in processing various polymer-based nanocomposites, the load transfer efficiency between particles and the matrix at different scales, use of nanoparticle-enhanced polymer to manufacture conventional fiber composites, and the inadequacy of the classical continuum approach and the potential solutions in modeling heterogeneous materials at various scales.

Biography

Professor C. T. Sun received his undergraduate education at National Taiwan University. He obtained his M.S. in 1965 and his Ph.D. in 1967 from Northwestern University. In 1968 he joined Purdue University, where he is presently Neil A. Armstrong Distinguished Professor in the School of Aeronautics and Astronautics. Professor Sun's research interests include composite materials and structures, fracture mechanics, modeling of nanostructured materials, and nonlinear behavior of ferroelectric materials. He has published more than 280 journal papers and a book entitled Mechanics of Aircraft Structures, 2nd edition. He is a Fellow of the American Society of Mechanical Engineers, American Institute of Aeronautics and Astronautics, and American Society for Composites. He was the recipient of the 1995 Distinguished Research Award of the American Society for Composites; the 1997 American Institute of Aeronautics and Astronautics Structures, Structural Dynamics and Materials Award; the 1997 Medal of Excellence in Composite Materials, Center for Composite Materials, University of Delaware; the 2004 Research Excellence Award in the Schools of Engineering, Purdue University, the 2005 Sigma Xi Purdue University Faculty Research Award, and the 2007 ASM Koiter Medal.

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