

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar Series

Professor Roberto Ballarini

Thomas and Laura Hsu Professor and Chair
Department of Civil and Environmental Engineering
University of Houston

About the speaker:



Structural Testing at the Micro and Nano Scales: Breaking Invisible Specimens with Zero Force

Monday, August 25, 2014

10:20 - 11:00 am Seminar

Room: D3 W205

Abstract

I will describe how a bunch of clever and hardworking students and research associates have pioneered the use of microelectromechanical systems (MEMS) platforms to measure the mechanical response of materials and structures at the micro and nano scales. Selected examples include measurements of strength, toughness, high cycle and static fatigue of brittle MEMS materials, the strength, ultimate strain capacity and viscoelastic response of individual collagen fibrils, and the fracture energy of the carbon nanotube-epoxy matrix interface. A brief description of several the theoretical and computational models that were inspired by the experimental observations will also be presented.

Professor Roberto Ballarini obtained his B.E. from City College of New York (1980), and his M.S. (1981) and Ph.D. (1985) from Northwestern University, all in Civil Engineering. He is currently Thomas and Laura Hsu Professor and Chair of Civil and Environmental Engineering at University of Houston. He was previously James L. Record Professor and Head of the Department of Civil Engineering at University of Minnesota.

Professor Ballarini's research focuses on the development and application of theoretical and experimental techniques to characterize the response of materials to mechanical, thermal, and environmental loads. He is particularly interested in formulating analytical and numerical models for characterizing fatigue and fracture of materials and structures. His multidisciplinary research has been applied to problems arising in civil engineering, mechanical and aerospace engineering, materials science, microelectromechanical systems, biological tissues and prosthetic design. He has published approximately one hundred refereed papers, and has given invited lectures at universities around the world. Several of his research projects have been featured in the popular press, including the New York Times Science Times, American Scientist, Pour la Science, Business Week, Financial Times of London and Geo.

