Interfaces and Hybrids in Compliant Materials: From DNA/SWCNT Hybrids to Biomimetic Structured Surfaces

by Prof. Anand Jagota

Date: 6th August 2013, Tuesday
Time: 3:00 to 4.00 pm
Venue: E2-03-02

Abstract

We will describe two broad areas of research in the behavior of compliant materials. The first is on the structure and properties of biomolecule-carbon nanotube hybrid materials. A prime example is the family of DNA/SWCNT (single wall carbon nanotube) hybrids that have proven to be very useful for carbon nanotube dispersion, sorting, and processing. We will discuss the unique structure of these materials and experimental approaches to interrogating the binding properties, including single molecule force spectroscopy and surfactant exchange kinetics. The second area of research concerns compliant materials, in particular their surface mechanical properties. Inspired by surface architectures in small animals that are used to impart useful and unique function to otherwise generic materials, we have investigated and analyzed how surface structures can be designed so as to control surface mechanical properties such as adhesion, friction, and contact compliance. In this context, we will also briefly describe recent work to study the effect of solid surface tension on deformation in compliant solids.

Speaker Prof. Anand Jagota

Anand Jagota is Robert W. Wieseman 1916 Professor of Chemical Engineering and Director of Bioengineering at Lehigh University, USA (and Visiting Professor in the Department of Materials Science & Engineering at the National University of Singapore). His formal training has all been in Mechanical Engineering. He received a B. Tech. from the Indian Institute of Technology, Delhi (India), and a PhD from Cornell University (USA). From 1988 to 2004, he worked as a research scientist at the DuPont company in the USA, with a break from 1994-96 to teach in the department of Applied Mechanics at the Indian Institute of Technology, Delhi (India). Since 2004, he has been at Lehigh University (USA). Jagota's interests are broadly in the mechanics of materials. Currently, his group works on biomolecule-nanomaterial hybrids, and on the mechanics of surface properties, specially in compliant materials.

ALL ARE WELCOME!

Dr Xue Jun Min Host