

**MIT Chemical Engineering Department  
Special Seminar**

**Prof. Amit Rawal**

**Dept. of Textile Technology, India Institute of Technology Delhi**

**Tuesday, December 11, 2018, 1:00pm, Room E17-517**

**Engineering a Family of Disordered Fiber Networks via Unified Theory Approach**

Disordered fiber networks (DFNs) are ubiquitous materials present in the form of paper, nonwovens, bulk assemblies of one-dimensional (1D) carbon nanomaterials, electrospun mats to interconnected networks of filamentous proteins. This talk will focus on a unified theory approach to predict the geometrical, mechanical, electrical and wetting characteristics of DFNs. Specifically, the unified theory approach has been successfully applied to the nonwoven materials and assemblies of carbon nanotubes in the form of buckypaper. The unified theory has been developed by combining the first principles of stochastic and stereological approaches. Further, the research challenges involved in formulation of unified theory would also be discussed.

*Amit Rawal obtained his Ph.D in Polymer Science from The University of Bolton, UK. He also received a Masters of Philosophy in the field of Textile Technology from The University of Manchester. He has several years of Post-Doctoral research experience in various countries including Council for Scientific & Industrial Research (South Africa), Katholieke Universiteit Leuven (Belgium) and University of Bolton (UK). Currently, he is working as Associate Professor at the Indian Institute of Technology Delhi, India. Recently, he has been awarded Alexander von Humboldt Research Fellowship for experienced researchers and Fulbright-Nehru Academic and Professional Excellence Fellowship. His research interests include mechanics of fiber networks, structure-property relationship of non-orthogonally interlaced materials and fluid transport phenomenon in fibrous assemblies.*

**Hosted by Prof. Gregory Rutledge, Department of Chemical Engineering,  
[rutledge@mit.edu](mailto:rutledge@mit.edu)**