



Cellulose Nanomaterials: An Enabling technology for a Sustainable Future

Dr. Robert J Moon

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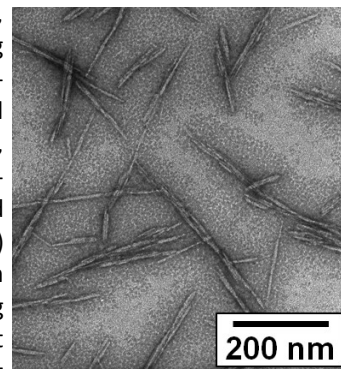
**Materials
Engineering
MSE 690
Fall 2019
Seminar Series**

**Monday, Sept. 9th
3:30 pm
ARMS 1010**

Abstract: Cellulose based materials (wood, cotton, etc.) have been used by our society as engineering materials for thousands of years and their use continues today as verified by the enormity of the world wide industries in forest products, paper, textiles, packaging, etc. A new family of cellulose based particles, cellulose nanomaterials (CNMs), are nanosized fibril-like particles (3-50 nm wide, 50-2000+ nm long) that have properties and functionalities distinct from molecular cellulose and wood pulp, and are being developed for applications that were once thought impossible for cellulosic materials. CNMs exhibit

unique characteristics due to their size, morphology and large surface area, and are inspiring advances in cellulose science, technology and product development in an ever growing application space, including but not limited to: polymer reinforcement, nanocomposites, rheology modifiers, cosmetics, cements, fibers/textiles, transparent-flexible electronics, biomedical implants, tissue engineering scaffolds, drug delivery, barrier/separation membranes, batteries, supercapacitors, catalytic supports, food coating, etc..

The first half of this seminar will provide a general introduction to CNMs, a review of CNMs research areas, an overview of CNM applications and products, and then the second half will focus on recent work at GaTech investigating approaches for incorporating CNMs into glass-fiber epoxy composites to produce lighter weight



Biography: Dr. Robert J. Moon is a Materials Research Engineer at the USDA Forest Service - Forest Products Laboratory, and is an Adjunct Professor in both the School of Materials Engineering (at Purdue University), and in the School of Materials Science and Engineering (at Georgia Institute of Technology). Dr. Moon received a B.S. in Metallurgy from the University of Wisconsin (1994), a M.S. (1996) and PhD (2000) in Materials Engineering from Purdue University. He is currently stationed at the Renewable Bioproducts Institute at Georgia Institute of Technology. Dr. Moon is an expert in processing-structure-property relationships as they apply in various aspects of cellulose nanomaterial research, such as, nanocomposites, hybrid composites, recyclable solar cells, multi-scale modeling, characterization, etc. He is an internationally recognized researcher in cellulose nanomaterials having over 45 peer reviewed journal publications, 1 critical review (3000+ citations in Google scholar), 2 patents, an editor of 1 book, 5 keynote/plenary talks, and 50+ invited talks all on cellulose nanomaterials. View full publication record at [Google Citations](#), [ResearchGate](#). Dr Moon is also active in the broader international research efforts of CNs, where he is the Chair of the Technical Association for Pulp and Paper Industry (TAPPI) Nanotechnology Division, a member of ISO standards development for cellulose nanomaterials, active in many workshops and roadmap development in the area of renewable materials.