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The Use of Cellulose Nanocrystals as Scaffolds for Nanodevices; Supramolecular Chemistry using Nature's most Abundant Template

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Over a number of years work in our laboratory has been exploring the use of cellulose nanocrystals (CNC) as scaffolds for the creation of novel nanomaterials with unique and stimuli responsive characteristics. The forces responsible for the spatial organization within cellulose, coupled with traditional chemistry are aimed at creating structures via molecular self assembly; these concepts have been the inspiration for our supramolecular research.

In this lecture we will report on our systematic efforts aimed at functionalizing CNCs by using both grafting from and grafting onto approaches. The selective creation and activation of a nano-pattern on CNC will be described and the chemical methods used to create the foundation for novel CNC based materials (including self-assembled Cellulose NanoPlatelet Gels) will be described.

Biography:

Dimitris Argyropoulos, Professor of Chemistry at North Carolina State University. He has also served as a Finland Distinguished Professor of Chemistry with the department of Chemistry of the University of Helsinki, Finland and Distinguished visiting Professor with the centre for Advanced Materials and the Department of Chemistry King Abdulaziz University, Jeddah, Saudi Arabia.

Professor Argyropoulos's research team is internationally recognized for his leading contributions to Green Chemistry using cellulose and lignin wood-based polymers. His work focuses at promoting our understanding of the structure and reactivity of such polymers and the development of novel NMR and material science techniques for the structural elucidation and upgrading of these biopolymers. The efforts of his research group have been disseminated in excess of 200 scientific papers, numerous scientific conferences invited presentations and patents. Professor Argyropoulos is a fellow of the Royal Society of Chemistry, International Academy of Wood science and the Chemical Institute of Canada.