Chemical Assembly of Materials at the Molecular Level

Dr. Qing (Chin) Peng
Electrical and Computer Engineering Department
Duke University

ABSTRACT

Chemical assembly of materials with atomic/molecular level control attracts significant interests from fields such as microelectronics, photonics, catalysis, renewable energy, energy storage, and biomaterials. Such sophisticated controllability relies on the understanding of fundamental principles of atomic/molecular assembly processes. In this seminar, I will present research studies of chemical assembly of materials by atomic layer deposition and its derivatives onto model polymeric substrates. The results show insights of how surface chemistries, competence of reaction and diffusion processes, and reaction chemistries affect the assembly process. Based on the fundamental understandings, promising applications in lithography, surface modification, and nanostructure engineering will be presented.

BIOGRAPHY: Qing Peng is currently a research scientist at Duke University in the Electrical and Computer Engineering Department. He did two-year postdoc at Argonne National Laboratory. He received PhD from the Department of Chemical and Biomolecular Engineering at North Carolina State University. His research interests include surface/interfacial engineering, self-limited molecular assembly strategies, nanoscience, photoelectronic devices, renewable energy, and catalysis, with a current emphasis on the photoelectrochemical energy generation processes and \textit{in-situ} analysis of surface reactions in heterogeneous molecular assembly.