DREXEL UNIVERSITY
Materials Science and Engineering
College of Engineering

Fall Seminar Series

Programmable Self-Assembly of Nanoscale Systems: Architectures, Processes, Functions

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PISB 104

The ability to organize nano-components into the desired organizations is one of the major limitations for creating material systems from nanoscale objects. Our efforts are focused on establishing a broadly applicable DNA-based platform to address this challenge. We explore novel concepts for creating targeted static and dynamic nano-architectures by bridging DNA-encoded nano-objects with structural plasticity of DNA macromolecular constructs. Through establishing effective assembly strategies, revealing the principles governing these DNA-programmable systems and understanding the effect of , we develop methods for creation of well-defined three-dimensional lattices, two-dimensional arrays and finite-sized cluster architectures from the inorganic and biomolecular nano-components. Our resent advances in creating inorganic, organic and hybrid nanoscale architectures and their applications for nano-optics and biomaterials will be discussed.

Gang earned MS and Ph.D. (2000) from Bar-Ilan University (Israel), specializing in Atomic Spectroscopy and Soft Matter, respectively. As a postdoctoral Distinguished Rothschild Fellow at Harvard University, he studied nanoscale wetting phenomena and structure of liquid interfaces. Gang has started at Brookhaven National Laboratory as a Distinguished Goldhaber Fellow in 2002, rising through the ranks to lead the Soft and Bio-Nanomaterials group at the Center for Functional Nanomaterials from 2008. In 2016, Gang has joined Columbia University as a Professor of Chemical Engineering, and of Applied Physics and Materials Science. Gang has received numerous awards and recognitions, including University President Award and Wolf Foundation scholarship for his PhD work, Rothschild and Goldhaber fellowships, Department of Energy Outstanding Mentor Award, Gordon Battelle Prize for Scientific Discovery, has been named Battelle Inventor of the Year, and he is a Fellow of American Physical Society.