

**SPRING 2023  
CHEMISTRY  
SEMINAR SERIES**



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**HOST:  
DR. ZHANG**

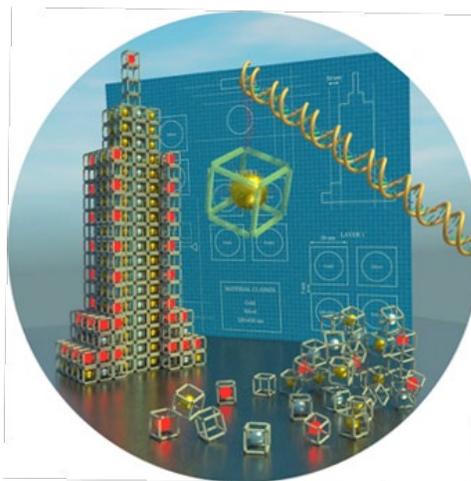
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ARE WELCOME TO  
ATTEND**

**RUTGERS**  
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Department of Chemistry  
73 Warren Street, Olson Hall  
Newark, New Jersey  
<https://sasn.rutgers.edu/chemistry>

**“Programming Assembly and Transformation of  
Nanoscale Materials”**

**Friday, January 27, 2023, 11:30 AM  
Life Science Center II, Room 130**



**Abstract:** The ability to organize diverse types of functional nanocomponents into the targeted architectures promises to enable a broad range of nanotechnological applications, from new classes of engineered biomaterials to photonic devices. However, the current top-down methods are limited in their ability to create 3D nanostructures with prescribed architecture and integration of different types of nanocomponents, while the typical bottom-up methods do not provide a flexibility of a system design. The talk will discuss an inverse design self-assembly strategies for the fabrication of large-scale and finite-size nano-architectures from diverse inorganic and biomolecular nanocomponents through the DNA-programmable approaches. The recent advances in creating periodic and hierarchical organizations from inorganic nanoparticles and proteins will be presented. The developed assembly approaches allow for creating functional nanomaterials with nano-optical, electrical, mechanical, and biochemical functions; some methods and examples of these efforts will be shown. Finally, the progress on establishing nanomaterial systems with prescribed transformation properties will be discussed.

**Biographical Sketch:** Oleg Gang is a professor of Chemical Engineering and Applied Physics and Materials Science at Columbia University, and a leader of the Soft and Bio-Nanomaterials Group at the Brookhaven National Laboratory’s Center for Functional Nanomaterials. His research explores self-assembly strategies for creating nanomaterials with targeted architectures, transformation properties and functions. Gang received Ph.D. in physics from Bar-Ilan University, following by a postdoc at Harvard University as Rothschild Fellow. After about a decade of scientific carrier at Brookhaven National Laboratory, Gang joined the Columbia faculty in 2016. His group develops novel methods for creating designed self-assembled systems, studies their structural properties and explores their functions for photonics, sensing, biomedical, mechanical and other applications. Gang is a Fellow of the American Physical Society and has received numerous accolades for his work.