



# POLYMER PROGRAM SEMINARS

## POLYMER PROGRAM SEMINAR

**Friday, August 31, 2018**

**11:00 AM, IMS 20**

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### **“Self-Assembly of Multi-Layered Metallo-Supramolecules with Increasing Complexity”**

Self-assembly as a powerful bottom-up approach has been extensively used by nature to create complex biological systems. Synthetic supramolecular chemistry aims to use the principles of biological self-assembly to construct artificial nanostructures using molecular building blocks with desired functions and properties. The corresponding abiological assemblies, however, still suffered from a lack of complexity and thus were unable to reach the high degrees of functionality found in natural systems. With the goal of increasing the complexity of metallo-supramolecules, we designed and assembled a series of concentric, multi-layered architectures. With direct self-assembly strategy, we initiated our study through building different generations of 2D structures using terpyridine ligand. In the ligand preparation, pyrylium and pyridinium salts chemistry significantly facilitated the synthesis of multitopic ligands. Such ligand with multiple binding sites provided high geometric constraints to induce the formation of discrete structures. Replacing terpyridine by pyridine, we were able to assemble 3D sphere-in-sphere supramolecules with increasing complexity and stability. Finally, step-wise self-assembly was applied to advance terpyridine-based supramolecular chemistry into a new level of sophistication through constructing different generation of supramolecular fractals.

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