Nebraska Engineering

FACULTY CANDIDATE SEMINAR

University of Nebraska-Lincoln
Department of Chemical and Biomolecular Engineering

Assembly Pathway Design For Hierarchically Structured Materials

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2:30 p.m. – 4:00 p.m.

Othmer Hall, Room 205

**Refreshments provided*

Abstract

Self-assembly is a promising strategy for making advanced functional materials with structure on multiple length scales. Fully utilizing this strategy requires principles for designing and selecting pathways likely to lead to successful self-assembly. In the first part of this talk, I will discuss design rules for bottom-up self-assembly of hierarchically structured materials. Using a minimal computer model of a porous crystal as a simple example of a hierarchically structured material, I will discuss (1) how building block design selects assembly pathways and (2) how thermodynamic and kinetic effects determine which pathways lead to successful self-assembly. In the second part of the talk, I will discuss how bottom-up and top-down approaches can converge to design new pathways. Using experiments and simulations of polypeptoid bilayer nanosheets as an example, I will focus on the use of an interface as a physical catalyst for material transformation.