

# BO QIAO

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**2 PM - 3PM**

**Steele 006**

**“Understanding the Non-covalent Interactions within Polymer Materials  
Leads to More Advanced Performance”**

**Abstract:** Non-covalent interactions (e.g., hydrogen bond, dipole-dipole interactions, and Coulombic interactions) are ubiquitous. These interactions have been utilized to develop molecular functions such as recognition, aggregation, and stimuli-response, leading to complex structures and molecular machines. Despite these achievements, optimizing the non-covalent interactions within polymer materials to improve their performance remains less explored. This talk will discuss our recent progress in tuning and studying the non-covalent interactions within three types of polymer materials: polymer electrolytes, light-responsive polymer networks, and gene-delivery polymers. First, we studied the impact of intermolecular interactions within polymer electrolytes on lithium conduction. Second, we utilized metal-ligand interactions to regulate the properties of photoswitches as cross-linkers in polymer networks. Third, we developed a synthetic strategy that grants access to a broad range of precisely defined gene-delivery polymers, potentially allowing us to fine tune the self-assembled structures of polymer vectors and nucleic acids.

**Bio:** Bo Qiao obtained his PhD degree in 2017 at Indiana University under the supervision of Prof. Amar Flood, studying anion supramolecular chemistry. From 2017 to 2020, Bo did post-doctoral research at MIT with Prof. Jeremiah Johnson and Prof. Yang Shao-Horn, studying polymer electrolytes in lithium-ion batteries. In September 2020, Bo joined Shanghai Tech University as an assistant professor.