



# Rensselaer

The HOWARD P. ISERMANN  
DEPARTMENT OF CHEMICAL AND  
BIOLOGICAL ENGINEERING

## CBE Seminar Series – Fall 2020

### Dr. Ruilan Guo

Freimann Collegiate Associate Professor of Engineering  
Department of Chemical and Biomolecular Engineering  
University of Notre Dame

**Seminar: Wednesday, October 21, 2020**

**2:30 p.m. (ONLINE)**

WebEx link: <https://rensselaer.webex.com/rensselaer/onstage/g.php?d=1204866498&t=h>

Password: CBESeminar

### “Hierarchically Functional Polymers for Advanced Membrane Separations”

#### Abstract:

Materials-driven, membrane-based separation technologies have great promise to dramatically drive down the energy consumption, carbon footprint and water intensity of traditional thermally-driven separation processes. The creation of novel membrane materials with precisely tailored structures and properties holds the key to providing low energy solutions to many of the separation-related challenges facing humanity in environment, energy, and sustainability. This presentation will describe strategies for molecularly engineered polymer membranes that are both structurally and functionally rich for energy-efficient gas separations. Specifically, this talk will introduce our recent efforts of developing a new platform of separation membrane materials based on iptycene-containing microporous polymers. The rich structural hierarchy and chemistry versatility of iptycene units offer great opportunities for generating well-defined yet highly tailorable microstructure and unique supramolecular interactions, which synergistically lead to intriguing membrane properties and exciting separation performance. Discussions will emphasize on new macromolecular design concepts and the understanding of fundamental structure-property relationships for this new class of polymer membrane materials.

#### Biography:



Ruilan Guo is the Freimann Collegiate Associate Professor of Engineering of the Department of Chemical and Biomolecular Engineering at the University of Notre Dame. Her research focuses on developing functional polymer materials for a wide range of applications including membranes for gas separations, polyelectrolyte membranes for fuel cells, ion-containing polymers for desalination and water treatment. Professor Guo earned her B.E. and M.E. in Materials Science & Engineering at Beijing University of Chemical Technology, her Ph.D. in Materials Science & Engineering from Georgia Tech. She was a postdoctoral fellow working with the late Professor James E. McGrath at Virginia Tech before joining Notre Dame. Dr. Guo is a recipient of 2013 Department of Energy Early Career Research Award, ACS Petroleum Research Fund for Doctoral New Investigators (2015), Inaugural Class of Influential Researchers by I&EC Research (2017), and MSDE 2020 Emerging Investigators. She is currently a Thrust lead of a NSF Engineering Research Center – CISTAR, and serves on the Editorial Advisory Board of ACS Applied Energy Materials.

**Due to COVID-19, no refreshments will be available for this seminar.**

For more information, please contact Lisa Martin ([swishl@rpi.edu](mailto:swishl@rpi.edu)) or Helen Zha ([zhar@rpi.edu](mailto:zhar@rpi.edu))