

Fall 2021 Department of Chemical and Biological Engineering Seminar Series
H. M. Comer 1026
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Local versus Global Measures of Local Property Changes Near Interfaces in Multicomponent Polymer Materials

Abstract: Nanostructured morphologies with extensive interfaces have become the hallmark of high performance multicomponent materials. Understanding how local material properties change near interfaces is clearly crucial to designing an optimized morphology to create the correct global macroscopic characteristics desired from an amalgam of these local effects. Contrary to the traditional textbook paradigm, our group has demonstrated that local dynamical properties across polymer domains can become strongly coupled upon welding of two dissimilar polymer interfaces creating broad gradients in local material properties. Using a localized fluorescence technique, we have investigated how the local glass transition temperature $T_g(z)$ changes across interfaces between glassy and rubbery polymers. This talk will summarize our efforts to understand these $T_g(z)$ changes, as well as correlate them with other material properties near interfaces by contrasting and comparing different types of interfaces: free surface, polymer–solid substrate, and polymer–polymer interface.

Bio: Connie B. Roth, a Professor of Physics at Emory University, received her Ph.D. and M.Sc. in Physics from the University of Guelph, Canada. Following postdoctoral positions at Simon Frazier University, Vancouver, and Northwestern University, Chicago, Dr. Roth joined Emory's faculty in 2007. Prof. Roth has received a NSF CAREER Award, ACS PRF Doctoral New Investigator grant, and was the 2009 recipient of the Division of Polymer Physics (DPOLY) UKPPG Polymer Lecture Exchange from the American Physical Society (APS). In 2019, she was named Fellow of the APS, and received the Fellow Award from the North American Thermal Analysis Society. She has edited a book on Polymer Glasses, and served as the DPOLY Program Chair for the 2020 APS meeting.