

# MSE SEMINAR

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113 McBryde Hall

3:30 - 4:30 PM (Refreshments at 3:00 PM)



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## **“Thiol-Mediated Photopolymerizations: Routes to Functional Polymer Networks, Surfaces, and Particles”**

### **Abstract**

Light-induced polymerization is an industrially viable process that offers numerous economic and technical advantages over conventional thermal polymerization, particularly toward the fabrication of crosslinked thermoset thin films. These advantages include rapid through cure, low energy requirements, ambient temperature processing, solvent-free resin compositions, and spatial and temporal control over the polymerization process. Thiol-mediated polymerizations, including the radical-mediated thiol-ene and thiol-yne, have emerged as valuable tools for the synthetic polymer chemist. Outstandingly, these reactions proceed at room temperature with high efficiency and rapid kinetics, in the presence of oxygen/water, without expensive and potentially toxic catalysts, without byproducts and are highly tolerant of a wide range of functional groups. This presentation will describe several vignettes from our recent work employing thiol-ene photopolymerizations to fabricate functional thermosets in the form of thin films, particles and capsules. These materials are aimed at bioinspired adhesion, bioinspired wetting, and biodegradable, bioactive applications.

### **Biosketch**

Derek L. Patton earned his B.S. in Chemistry (2000) from Jacksonville State University and his Ph.D. in Chemistry (2006) at the University of Houston. In 2006, he moved to NIST (Gaithersburg, MD) as a NRC Postdoctoral Fellow in the Polymers Division, and in 2008, he joined the faculty in the School of Polymers and High Performance Materials at the University of Southern Mississippi. In 2014, Derek was promoted to Associate Professor with tenure. His research group currently focuses on the development of functional polymer surfaces using surface-initiated polymerization, thiol-mediated postpolymerization modification reactions, and thiol-ene photopolymerization. He was awarded the NSF CAREER Award and the USM Junior Faculty Research Award in 2011, and the College of Science and Technology Faculty Research Award in 2015. Derek leads the NSF Research Traineeship “Interface” program at USM – an interdisciplinary graduate training program that focuses on transcending the divide that currently exists between experimental, theoretical, and computational scientists under the research theme of “Complex Interfaces”. Derek currently serves as Treasurer for the ACS Division of Polymer Chemistry