**Department of Chemical Engineering**

**Seminar Schedule**

**Multi-functional liquid crystalline epoxy networks**

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**Abstract**

Liquid crystalline networks (LCNs) are versatile functional materials because of the unique properties of liquid crystalline molecules, e.g., self-organization, reversible phase transition, and macroscopic orientation under external fields. The coupling between LC molecules and polymer networks allows these remarkable properties to be transferred to the bulk material and has resulted in a number of functional LCNs that are thermally-responsive and can change their shape reversibly due to the reversible LC phase transition upon temperature cycling. The incorporation of photo-responsive chromophores into LCNs allows the material to convert light energy into mechanical work because of the transformation between two geometrically different azobenzene isomers upon light irradiation. Here we demonstrate a simple route to incorporate three functional building blocks, including azobenzene chromophores, liquid crystals, and dynamic covalent bonds, together into a liquid crystalline epoxy network. The three functionalities show good compatibility and the resulting material can exhibit various photomechanical responses, dual-stimuli induced shape memory and self-healing properties, and excellent processability and recyclability.

**Bio**

Michael Kessler is the Dean of the College of Engineering at North Dakota State University. He arrived in Fargo from Pullman, WA in 2017 where he was a professor and Director of the School of Mechanical and Materials Engineering at Washington State University (WSU). Prior to his appointment at WSU in August 2013, he was the Wilkinson Professor in Interdisciplinary Engineering in the Department of Materials Science and Engineering at Iowa State University. He obtained his PhD from the University of Illinois at Urbana Champaign in 2002. His research focus is in the mechanics, processing, and characterization of polymer matrix composites and nanocomposites. He has published over 175 journal papers and 9000 citations, holds nearly 20 patents and provisional patents, edited 14 books, presented over 200 talks at national and international meetings, and serves as a frequent reviewer and referee in his field.

**Seminar**

**Friday, March 23rd**

**3:00 pm**

**Livermore 101**