

MATERIALS SCIENCE GRADUATE PROGRAM

SEMINAR ON LIQUID CRYSTALS

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AMLCI 101



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Applications of Liquid Crystals Beyond Display Technology

Liquid crystals (LCs), a representative class of structured fluids that exhibit properties commonly associated with crystalline solids (long-range orientational ordering) and simple fluids (high molecular mobility), have been widely used in display technology. However, considering the tremendous switch from liquid crystal displays (LCDs) to light emitting diode (LED) displays, my research aims to broaden the applicability of LCs beyond display technology. In my presentation, I will initially discuss the development of an LC-based sensor for detecting COVID-19 virus RNA, highlighting the inherent long-range ordering and stimuli-responsiveness of LCs. Next, I will show how LCs can be used to manipulate the release of confined objects in response to external stimuli. Specifically, the impact of droplets induces shear forces, prompting structural changes in the LC that facilitate chemical release, with potential applications in additive manufacturing. Finally, I will explore the innovative use of LCs as a new solvent for aligning polymer chains of intrinsically amorphous polymers during polymerization, which offers unprecedented control over their properties and unlocks their potential in shape-changing polymers.



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