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Light-directing self-organized chiral liquid crystalline nanostructures: From 1D to 3D photonic crystals

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Liquid crystals (LCs) represent a fascinating state of matter which combines order and mobility on a molecular and supermolecular level. The unique combination of order and mobility results in that LC is typically “soft” and responds easily to external stimuli. The responsive nature and diversity of LCs provide tremendous opportunities as well as challenges for insights in fundamental science, and open the door to various applications. Conventional nematic LCs have become the quintessential materials of LC displays. With the LC displays ubiquitous in our daily life and annual ~\$200 billion market, the research and development of LCs are moving rapidly beyond display applications and evolving into entirely new and fascinating scientific frontiers. In my talk, I will focus on our recent research and development, rooted in materials chemistry, on light-directing self-organized chiral liquid crystalline nanostructures: from 1D to 3D photonic crystals for photodisplay, laser steering, smart window and beyond.

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