Abstract Submitted
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Self-assembly and separation of nematic colloids through photo-patterned molecular orientation[1] CHENHUI PENG, YUBING GUO, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH 44242, USA, CHRISTOPHER CONKLIN, JORGE VIALS, School of Physics and Astronomy and Minnesota Supercomputing Institute, University of Minnesota, Minneapolis, MN 55455, USA, SERGIJ SHIYANOVSKII, QI-HUO WEI, OLEG LAVRENTOVICH, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH 44242, USA, OLEG D. LAVRENTOVICH TEAM, JORGE VIALS COLLABORATION — Design and control of particles self-assembly is an important theme in colloidal science. Dispersions of colloids in a nematic liquid crystal (LC) show a diversity of self-assembled structures guided by long-range interactions. Here we describe a versatile approach to control colloidal structures through surface-patterned molecular orientation and dynamic processes of LC-enabled electrokinetics (LCEK). In presence of the electric field, the surface-imprinted pattern of molecular orientation triggers LCEK flows which transport the colloidal aggregates to specified locations. The aggregation is directed by the director gradients. Colloids that differ in surface anchoring or shape are guided into different areas of the cell, thus being sorted. The dynamic approach to control colloidal systems through LCEK in cells with patterned director field opens the opportunities in the microfluidic and lab on a chip applications.

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Chenl
Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH 442

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