

Liquid Crystals in Quantum and Nano-Photonics

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A review will be presented on using liquid crystal properties of molecular alignment, self-assembly into photonic bandgap structures, and high responsiveness to temperature and external fields in quantum and nano-photonics. The author's results on single-photon sources with definite polarizations and collaborative research on using liquid crystals for modeling quantum mechanical tunneling phenomena will be overviewed [1-7]. Advances in transparent planar optics using modulation of the geometrical (Pancharatnam-Berry) phase will be outlined [8,9]. Future prospects of patterned liquid crystals, topological defects, and tunability of nanostructure properties with these materials will be discussed [10-14].

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