

## **Liquid Crystal Alignment by Optical Interference and Its Application in Making Polarization-Independent Phase Diffraction Gratings**

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**Abstract:** Inhomogeneous liquid crystal (LC) alignment surfaces comprising a succession of microdomains favoring different LC alignment directions have been demonstrated for a plethora of optoelectronic applications. These include wide-viewing-angle display, projection display, optical grating, bistable displays, no-bias bend-splay display, *etc.* However, the common methods used to fabricate these surfaces are time consuming or produce areas that are too small for practical use. In this talk, I will describe a simple method based on photopatterning of an azodye layer twice with an interference pattern produced by intercepting two coherent UV beams sequentially *p* and *s* polarized. This method can produce alignment patterns within seconds with a practical size of  $\sim(0.5 \text{ cm})^2$ . Application of this method in making polarization-independent phase diffraction gratings will also be demonstrated.