MEETING NOTICE & INVITATION
Pacific Northwest Chapter • Society for Information Display

In-situ Control of Surface Molecular Order in Nematic Liquid Crystals using a Localized Polymer Network and its Application to Optical Elements

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Wednesday, April 26th - 6:00 P.M.

Microsoft
Room 1004, Building 87 (Hardware bldg.)
4729 154th Place NE
Redmond, WA 98052

Abstract

We developed a liquid crystal (LC) alignment technique that allows for local control of the polar pretilt angle in the range 0-90º. This was achieved via the formation of a polymer network localized in the vicinity of the LC cell substrates. The network was formed as a result of in-situ UV-light-induced polymerization of a photo-reactive monomer added in concentrations of 0.5-1%. Localization of the polymer network at the LC-substrate boundary was achieved by the application of a high voltage before polymerization. The resultant pretilt angle was determined by the voltage applied during the polymerization and/or the duration of the voltage application before the polymerization step. The desired pretilt angle can be set over a small area of the sample which allows for the fabrication of LC devices with spatially variable optical retardation. Using this method, we fabricated electrically tunable/switchable converging lens, bi-prism, and phase diffraction grating.

Speaker Biography

Vassili Sergan, Professor of Physics at California State University, Sacramento started his scientific career in 1984 after graduating Rovno State University (Ukraine) with master's degree in Math and Physics. His research (at Institute of Physics, Ukrainian Academy of Sciences) in the area of electro-optics of Liquid Crystals (LC) earned him PhD in Solid State Physics in 1990. After that he occupied various visiting research positions around the world, while maintaining his principal appointment as a senior research fellow at Institute of Physics, Ukrainian Academy of Sciences. His main research focus was always related to electro-optics of Liquid Crystals: improvements of PDLC, studies of switching dynamics of cholesteric displays, using LC in laser beam steering devices, studies of alignment and anchoring of LC on various surfaces, implementation of polymer-doped LCs, just to name few.

In 2002, Vassili Sergan joined Physics and Astronomy Department at California State University, Sacramento. His main responsibility there is teaching, but he manages to maintain an active research program there. His publication portfolio contain more than 50 papers in highly regarded journals, several US and European patent. He presenter his work at numerous international conferences and Symposia. He serves currently as the Director of the SID Ukraine chapter.

Seminar

The Seminar is free. Please join the speaker for a no-host dinner after the seminar. Directions to the restaurant will be provided at the seminar. Non-Members are welcome. RSVP to Gary Johnson at Gary.Johnson@tek.com or (503) 627-1985. Please indicate if you plan to participate in the dinner.

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