

RMOSA

Rocky Mountain Section of the Optical Society of America



Joint RMOSA/IEEE Photonics Seminar & Meeting

Thursday, April 16, 2009

Refreshments: 7:00 p.m. Seminar: 7:30 p.m.

Room 340, Koelbel Building, Leeds Business School, CU, Boulder

Polymer Dispersions of Liquid Crystals for use in Advanced Electro-Optical Devices

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Abstract: The phase separation process in liquid crystal-polymer systems can lead to very interesting morphologies. This intensely studied field has been the subject of numerous publications and review articles over the past decades. Recent developments have led to devices such as smart windows, switchable diffractive gratings, narrow bandwidth notch filters, photo-assisted liquid crystal alignment process, high-reflective displays, tunable nanophotonic devices, tunable negative index materials, high transmissive spatial light modulators, ultra-fast retarders and polarization control devices. In this talk I will discuss some of the techniques currently used for dynamic phase separation and control of morphologies in a polymer/liquid crystal materials set. Fabrication methods such as flood lit, mask lithography and holographic photo-polymerization techniques will be discussed in detail along with the kinetics and dynamics of the phase separation processes that govern the expected morphologies. By tailoring the materials material characteristics, concentrations and morphology one can exploit the interesting electro-optical properties inherent in liquid crystals for use in numerous advanced optical systems. Introduction to several advance electro-optical devices utilizing the polymer/liquid crystal materials set will be discussed with both fabrication and device performance evaluated.

Bio: Dr. Robert Ramsey is currently a Senior Optical Engineer at Meadowlark Optics Inc, in Frederick, CO. He received his Ph.D in applied physics from the University of Texas at Arlington. His research areas include polymer stabilized liquid crystals for microsecond response time variable retarders, holographic photo-polymerization methods for electro-optically tunable VIS-IR band reject filters, super-prism and Bragg beam steering devices as well as nanocomposite materials development for nonlinear optical devices.

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