F-5 SEMINAR

CONDENSED MATTER PHYSICS

Friday, September 23, 2022
at 10:30 AM

in the seminar room of physics (room 106)
Condensed MatterPhysics, Jožef Stefan Institute

Prof. Pankaj Kumar

Department of Applied Sciences,Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India

Topographically Induced Vertical Alignment of Liquid Crystal via Self Assembled Spherical Nanoparticles

The vertically aligned liquid crystal (VALC) displays have dark black back-ground color, higher contrast ratio and better image quality compared with in-plane switching (IPS)/twisted nematic displays. Consequently, as an alternative of polyimide alignment layer different approaches have been used to control the vertical anchoring of liquid crystal (LC) for display applications. The work reported herein advances the approach to achieve the vertical alignment (VA) of liquid crystals (LCs) by directly forming the multilayer self assembly of spherical nanoparticles (NPs) on the indium tin oxide (ITO) substrates in a confined cell. The present study is focused mainly on the formation and process of topographically induced VA of LC as well as to understand the nature of interaction between the self assembled spherical NPs and LC molecules. The polar anchoring energy (5.51×10^{-5} J/m^2) of the NPs surface for nematic LC molecules was found in a similar range to the conventional polyimide alignment layer (2.11×10^{-5} J/m^2) used for commercial applications. The morphological and electro-optic results of the prepared VALC cells will be discussed in detail for display application.

You are cordially invited to attend.