



**LIQUID CRYSTAL MATERIALS**  
**RESEARCH CENTER**  
*SPECIAL SEMINAR SERIES*

**Ferroelectric particles in liquid crystals:  
recent frontiers**

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In this review we present a new method of modifying the properties of existing liquid crystals by doping them with ferroelectric micro- and nanoparticles. We show that this approach, in contrast to the traditional time consuming and expensive chemical synthetic methods, enriches and enhances the electro-optical performance of many liquid crystal materials. We demonstrate that by changing a concentration and a type of ferroelectric particles one can affect physical properties of the nematic, smectic, and cholesteric liquid crystal materials, including the dielectric constants, the birefringence, the phase transition temperatures, and even the order parameter. We bring a phenomenological model of interaction between the particles and liquid crystals, which explains the observed effects. We also demonstrate the performance of these new materials in various devices, including displays, light modulators, and beam steering devices.

**Wednesday 10/12/05 at 1:00 pm**  
**Duane Physics, 11th floor commons room**



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