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This unique book aims to expose the reader to a wide range of phenomena occurring when soft matter systems are put under the influence of an external electric field. The book shows how an electric field can be used to affect objects at the submicron scale, and how it controls the phase behavior of liquids and polymers. The main focus is on the basic underlying mechanisms. Some technological applications are dealt with as well.

Book chapters are arranged in a logical order, from "simple" systems to more complicated ones. In addition, each topic is covered by the mixed bag of theory, experiment and simulation; and this will give the reader a broad perspective of the underlying physical phenomena.

Contents:

The Phenomenology of Modulated Phases: From Magnetic Solids and Fluids to Organic Films and Polymers (D Andelman & R E Rosensweig)

Solvation Effects of Ions and Ionic Surfactants in Polar Fluids (A Onuki)

Change of Critical Mixing Temperature in a Uniform Electric Field (K Orzechowski)

Electrohydrodynamic Instabilities of Thin Liquid Films (T P Russell & J Bae)

Electrowetting: The External Switch on the Wettability and Its Applications for Manipulating Drops (F Mugele)

Phase Separation and Morphology of Polymer Mixtures Driven by Light (Q Tran-Cong-Miyata & H Nakanishi)

Thermodynamics and the Phase Diagrams of Block Copolymers in Electric Fields (M Schick)

Orienting and Tuning Block Copolymer Nanostructures with Electric Fields (A Boeker & K Schmidt)

Block Copolymers Under an Electric Field: A Dynamic Density Functional Approach (A V Zvelindosky & G J A Sevink)