



# Flexoelectricity in Liquid Crystals: Theory, Experiments and Applications

*Ágnes Buka, Nándor Éber*

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The book intends to give a state-of-the-art overview of flexoelectricity, a linear physical coupling between mechanical (orientational) deformations and electric polarization, which is specific to systems with orientational order, such as liquid crystals.

Chapters written by experts in the field shed light on theoretical as well as experimental aspects of research carried out since the discovery of flexoelectricity. Besides a common macroscopic (continuum) description the microscopic theory of flexoelectricity is also addressed. Electro-optic effects due to or modified by flexoelectricity as well as various (direct and indirect) measurement methods are discussed. Special emphasis is given to the role of flexoelectricity in pattern-forming instabilities.

While the main focus of the book lies in flexoelectricity in nematic liquid crystals, peculiarities of other mesophases (bent-core systems, cholesterics, and smectics) are also reviewed. Flexoelectricity has relevance to biological (living) systems and can also offer possibilities for technical applications. The basics of these two interdisciplinary fields are also summarized.

## Contents:

- Introduction to Flexoelectricity: Its Discovery and Basic Concepts (*R B Meyer*)
- Molecular Theory of Flexoelectricity in Nematic Liquid Crystals (*M A Osipov*)
- Flexoelectro-optics and Measurements of Flexocoefficients (*N V Madhusudana*)
- Flexoelectricity of Bent-core Molecules (*A Jáklí, J Harden and N Éber*)
- The Role of Flexoelectricity in Pattern Formation (*Á Buka, T Tóth-Katona, N Éber, A Krekhov and W Pesch*)
- Flexoelectricity in Chiral Polar Smectics (*M ?epi?*)
- Flexoelectricity in Lyotropics and in Living Liquid Crystals (*A G Petrov*)
- Applications of Flexoelectricity (*P Rudquist and S T Lagerwall*)
- Appendix A. Measured Flexoelectric Coefficients of Nematic Liquid Crystals (*N Éber*)
- Appendix B. Abbreviations

**Readership:** Graduate students and researchers in physics, biology and their applications.

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