# Colloidal and molecular electro-optics



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## PREFACE

# Colloidal and molecular electro-optics

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The Kerr effect, also known as the quadratic electro-optic effect, was discovered more than a hundred years ago by John Kerr, a Scottish physicist [1]. It describes the change in the refractive index of a material in response to an applied electric field. Around 1950 its application swayed from simple to complex fluids. A strong contribution was made through a number of seminal papers by the French polymer scientist H Benoit [2–4]. These and others initiated wide interest from researchers working on macromolecular solutions or colloidal dispersions. Experimental activities were further boosted by the advent of the laser and theoretical approaches strongly drew from growing computer power. Use of AC or pulsed field techniques, as well as of inhomogeneous fields, including laser tweezers, studies of electrophoretic, dielectrophoretic, electro-osmotic and other types of motion by advanced optical methods and combinations with other external fields have had the greatest impact on our understanding of the electric field induced optical properties of soft matter systems.

Today the field has matured and its techniques are broadly employed as versatile tools with applications ranging from biological systems to electronic ink. Fundamental interest still continues but more and more side branches have evolved fruitfully. This collection of papers was, therefore, brought together to take a fresh look at this traditional field. Further, we are to celebrate 35 years of a successful conference series, ELOPTO, with the last one held at Waldthausen Castle hosted by the Johannes Gutenberg University, Mainz[1] and the DFG Collaborative Research Centre TR6 'Physics of colloidal dispersions in external fields'[2]. In this issue we have collected the articles of some of the leading experts in the area, well garnished with novel approaches and clever ideas by younger colleagues. With our selection we hope to cover a representative spectrum of the ongoing research, catch the most exciting trends and earn the interest of a good fraction of contemporary soft matter scientists.

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