

# Nonlinear electrokinetics in nematic electrolytes

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Abstract: Inm this talk we present a system of nonlinear PDEs modelling the electrokinetics of a nematic electrolyte material consisting of various ions species contained in a nematic liquid crystal. The evolution is described by a system coupling a Nernst-Planck system for the ions concentrations with a Maxwell's equation of electrostatics governing the evolution of the electrostatic potential, a Navier-Stokes equation for the velocity eld, and a non-smooth Allen-Cahn type equation for the nematic director field. We focus on the two-species case and prove a priori estimates that provide a weak sequential stability result, the main step towards proving the existence of weak solutions. This is a joint work with Eduard Feireisl, Giulio Schimperna and Arghir Zarnescu.