1172-76-92 **Fizay-Noah Lee***, fl6@math.princeton.edu. *On the Nernst-Planck-Navier-Stokes system.*

We discuss electrodiffusion and electroconvection of ions (two or more species) in a fluid in the presence of boundaries, described by the Nernst-Planck-Navier-Stokes equations. We give an overview of various physically relevant boundary conditions that model ion-selective membranes and applied electric potentials, and discuss questions of well-posedness and long time behavior. The answers to these questions depend heavily on both the boundary conditions and spatial dimension considered. We highlight some of the milestone results in the context of well-posedness theory, including some recent results, and discuss some open problems and remaining challenges. (Received August 18, 2021)