Vlasov-Poisson type systems are well known as kinetic models for plasma. The `classical' version of the system describes the electrons in the plasma; however, to describe the ions, the Vlasov-Poisson system with massless electrons (VPME) is more appropriate. The key difference is that the VPME system includes an additional exponential nonlinearity in the equation for the electrostatic potential, which creates several mathematical difficulties. In particular, while for the electron model the well-posedness theory in 3 dimensions is well established, the theory for ion models has been investigated more recently. In this talk I will discuss recent developments in the well-posedness theory for VPME and the problem of deriving the equation from an underlying particle system. In particular I will present results, obtained in collaboration with Mikaela Iacobelli, on global well-posedness for the 3-dimensional model, as well as a derivation of the equation in a regularised mean field limit from a system of extended charges. Further to this, I will discuss how our approach can be connected to results on the quasi-neutral limit in order to derive the Kinetic Isothermal Euler system from a system of extended charges.