Haptics is the field that deals with technology that stimulates the sense of touch and motion. Haptic researchers are working to create the same level of fidelity in touch-based recording and display that we currently have in audio and video. This talk will cover the work being done here at Texas A&M in the INVENT Lab to better understand the complex nanoscale phenomena impacting the finger-device interface such as capillary forces and surface tension, electrowetting, electrophoresis, multiphase flow, and soft tissue contact mechanics. It will also cover how this multiphysics understanding can be used to model and design devices with improved performance and higher reliability.