

**Title:** Kinetic theory of inertial suspensions: discontinuous change of viscosity and Mpemba effect

**Abstract:**

The discontinuous shear thickening is a drastic rheological phase transition in which the viscosity discontinuously changes at a critical shear rate for dense suspensions. A similar discontinuous transition known as the quenched-ignited transition exists for dilute inertial suspensions. In this talk, at first, we develop a systematic kinetic theory describing such a transition for inertial suspensions. We also clarify how the results depend on the density of suspensions. Second, we discuss Mpemba effect which is an anomalous relaxation, i. e. a hotter liquid can have lower temperature than for a colder liquid based on the kinetic theory.