Initiation of liquid-solid contact beneath an impacting drop
SHMUEL RUBINSTEIN, Harvard University, JOHN KOLINSKI, The Hebrew University of Jerusalem — Before an impacting drop contacts the solid surface it must first drain the air beneath it. As a prelude to wetting, before any contact occurs, the impinging liquid confines the intervening air into a nanometers-thin film. Once liquid-solid contact initiates by the spontaneous formation of a liquid bridge, the fluid rapidly wicks through the thin film of air, permanently binding the drop to the surface. Here, we experimentally examine these initial stages in the formation of the liquid solid contact beneath the impacting drop. Fast TIR microscopy enables unprecedented spatial and temporal resolution of the wetting process beneath the impacting drop and permits 3-dimensional imaging of the real contact line as well as nanometer-resolution of the thin film of air separating the liquid from the solid.