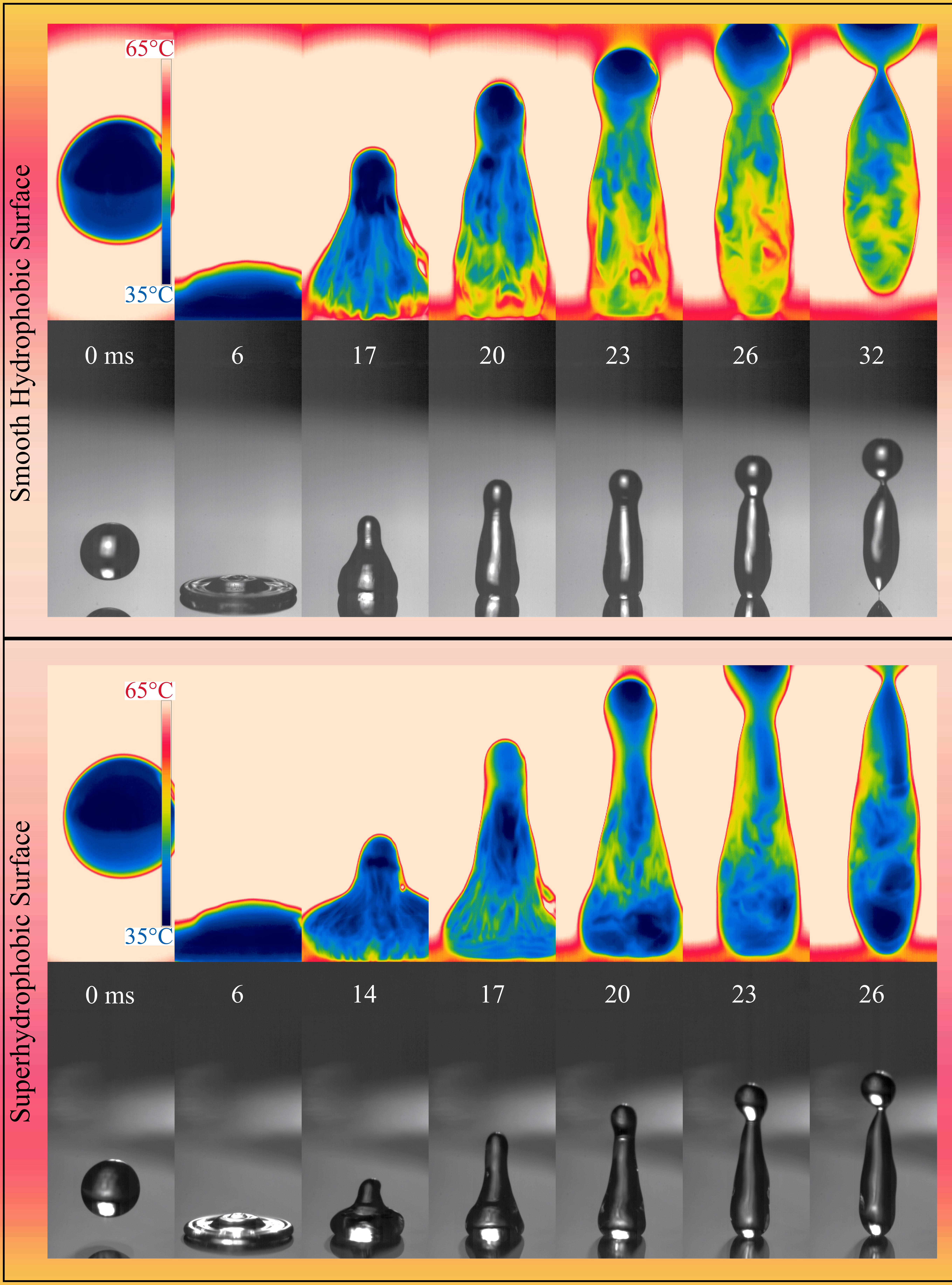

Sizzling droplets: heated superhydrophobic surface impingement

C. Clavijo, M. Searle, D. Maynes, J. Crockett & T. Truscott

Department of Mechanical Engineering
Brigham Young University, Provo, UT

The liquid droplet and solid surface interaction is among some of the most ubiquitous phenomena observed in nature. Though much research has been devoted to the hydrodynamic interaction between water droplets and heated superhydrophobic (SH) surfaces, less is known about the heat transfer mechanisms involved. With the development of high speed thermal cameras, we can now better understand the thermal influence of the air-solid composite layer that forms underneath a droplet when it impacts a SH surface. Here we show two image sequences of the impingement of a droplet (*We*~40) at 35°C on a heated smooth hydrophobic (above) and SH (below) surface recorded by a thermal and high speed camera, simultaneously, with both surfaces maintained at 105°C. The thermal images provide evidence that indeed significantly less heat transfer occurs during the impingement process on a SH surface. This is a result of the insulating air-solid composite layer that prevails between the droplet and the SH surface during impingement, as well as the shorter amount of time spent on the surface before rebound.

Acknowledgements:
This research was supported by the National Science Foundation (NSF) (Grant No. CBET - 1235881)