Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

**Theoretical and Experimental Analyses of Molten Droplet Impact on Cold Substrates** ELAHEH ALIZADEH-BIRJANDI, H. PIROUZ KAVEHPOUR, University of California, Los Angeles (UCLA) — Spreading of liquid drop on cold solid substrates is a complicated problem that involves heat transfer, fluid dynamics, and phase change physics with the combination of complex wetting behavior of contact line. Many researchers are trying to obtain the final shape of the droplet or in other words the contact angle and radius of the drop after the solidification is complete. Understanding the physics behind the non-isothermal spreading of droplet is of utmost importance owing to its broad applications in diverse areas of industry. This work mainly focuses on obtaining important physical parameters involved in the process of spreading of molten droplets as well as controlling the post-solidification geometry of droplets. A complete set of experimental study is performed that shows the final radius in the case of free fall of droplet under high impact velocity is independent of the initial condition of the impact including the impact velocity and temperature gradients. The analytical modeling of the problem also verifies the accuracy of these results.

Elaheh Alizadeh-Birjandi
University of California, Los Angeles (UCLA)

Date submitted: 01 Aug 2016 Electronic form version 1.4