

Abstract Submitted
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Out of the frying pan: Explosive droplet dynamics JEREMY MARSTON, CHAO LI, Texas Tech University, TADD TRUSCOTT, MOHAMMAD MANSOOR, Utah State University — Regardless of culinary skills, most people who have used a stove top have encountered the result of water interacting with hot oil. The phenomenon is particularly memorable if the result is impingement of hot fluid on one's skin. Whilst ubiquitous, a deeper probing of this phenomenon reveals a vastly rich dynamical process. We use high-speed imaging to investigate the idealized case of a single water droplet impacting onto a hot oil film. At a qualitative level, we have observed three regimes of fluid ejection – jets, cones and explosive vaporization. The latter of these results in the spectacular creation of aerosol with sizes down to the sub-micrometer range. We present our experimental findings based upon control parameters such as temperature, film thickness and oil type.

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