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View Abstract

CONTROL ID: 3244792**PRESENTER:** Carlo Antonini**Abstract Details****PRESENTATION TYPE:** Oral Presentation Preferred**Symposium:** SB11: Multiphase Fluids for Materials Science—Droplets, Bubbles and Emulsions**Abstract****TITLE:** Self-lubrication of immiscible compound drops upon impact**AUTHORS (FIRST NAME, LAST NAME):** [Carlo Antonini](#)^{1,3}, Nathan Blanken², Muhammad Saeed Saleem², Marie-Jean Thoraval²**INSTITUTIONS (ALL):** 1. University of Milano-Bicocca, Milano, Italy.

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ABSTRACT BODY:

Abstract Body: With the emergence of additive manufacturing technologies, such as "in-air microfluidics", compound drops are attracting an increasing attention. One of the critical challenges 3D printing applications is to control the deposition process of the impacting drop and therefore its spreading, potential rebound and splashing.

By studying the dynamics of compound drops consisting of immiscible liquids, we identified the mechanism of self-lubrication of water-in-oil compound drops impacting on a solid surface. The presence of an oil shell encapsulating a core water drop acts as a lubricating layer promoting water rebound even on a hydrophilic substrate, on which water deposition is typically expected.

We define the mechanisms and the conditions that lead to deposition or rebound of the inner water drop, as such providing design guidelines for the printing of compound drops to be used in additive manufacturing.

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