

Abstract Submitted
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Marangoni bursting¹ ETIENNE REYSSAT, PMMH-ESPCI, LUDOVIC KEISER, PMMH-ESPCI / Total S.A., HADRIEN BENSE, PMMH-ESPCI, PIERRE COLINET, TIPS - Universit Libre de Bruxelles, JOS BICO, PMMH-ESPCI — At the surface of a sunflower oil bath, a drop of water adopts a lenticular shape. Conversely, alcohol totally wets the oil and spreads. Depositing a mixture of water and alcohol reveals a spectacular fragmentation phenomenon. If it contains enough alcohol, the drop spontaneously spreads and fragments into a myriad of minute droplets whose size strongly depends on the initial mixture composition. Marangoni flows resulting from the differential evaporation of alcohol and water play a key role in this self-emulsification process. The intricate coupling of hydrodynamics, wetting and evaporation is well captured by analytical scaling laws that predict the characteristic radius and timescale of spreading. Other combinations of liquids also lead to this fascinating phenomenon and further confirm our scenario.

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