

Abstract Submitted
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Bubbles in drops: from cavitation to exploding stars¹ PHILIPPE KOBEL, DANAIL OBRESCHKOW, NICOLAS DORSAZ, AURELE DE BOSSET, MARC TINGUELY, MOHAMED FARHAT, Ecole Polytechnique Federale de Lausanne — We performed an experiment to generate single cavitation bubbles inside centimetric quasi-spherical water drops. To produce such drops, our experiment was realized under microgravity conditions (42nd ESA parabolic flight campaign). The ultra-fast recording of the bubble collapse and ensuing dynamics revealed consequences of the unique geometry of the drop’s free surface. We obtained the first visualizations of a jet pair escaping the drop after the collapse of eccentrically-placed bubbles. The high quality of the images also disclosed some features of the inner drop dynamics. Due to their confinement within the isolated drop volume, shock waves emitted at the bubble collapse bounce back and forth thereby exciting gas nuclei into sub-millimetric bubbles. When located beneath the free surface, the collapse of these bubbles gives rise to narrow “hair-like” jets on the surface. Here we briefly describe the physics underlying these observations while discussing possible analogies with various astrophysical processes from the Sun (spicules) to asymmetric supernovae.

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