

## ABYSS AEROSOLS

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Over the past century, drops production mechanisms from bubble bursting have been extensively studied, with an ever renewed interest. They include the centrifugal fragmentation of liquid ligaments from the bubble cap during film rupture, the flapping of the cap film, and the disintegration of Worthington jets after cavity collapse.

We show here<sup>1</sup> that a dominant fraction of previously identified as ‘surface bubble bursting’ submicron drops are in fact generated underwater, in the abyss, inside the bubbles themselves before they have reached the surface. Several experimental evidences (Fig. 1) demonstrate that these drops originate from the flapping instability of the film squeezed between underwater colliding bubbles.

This finding, emphasizing the eminent role of bubble-bubble collisions, alters fundamentally our understanding of fine aerosols production and opens a novel perspective for transfers across water-air interfaces.

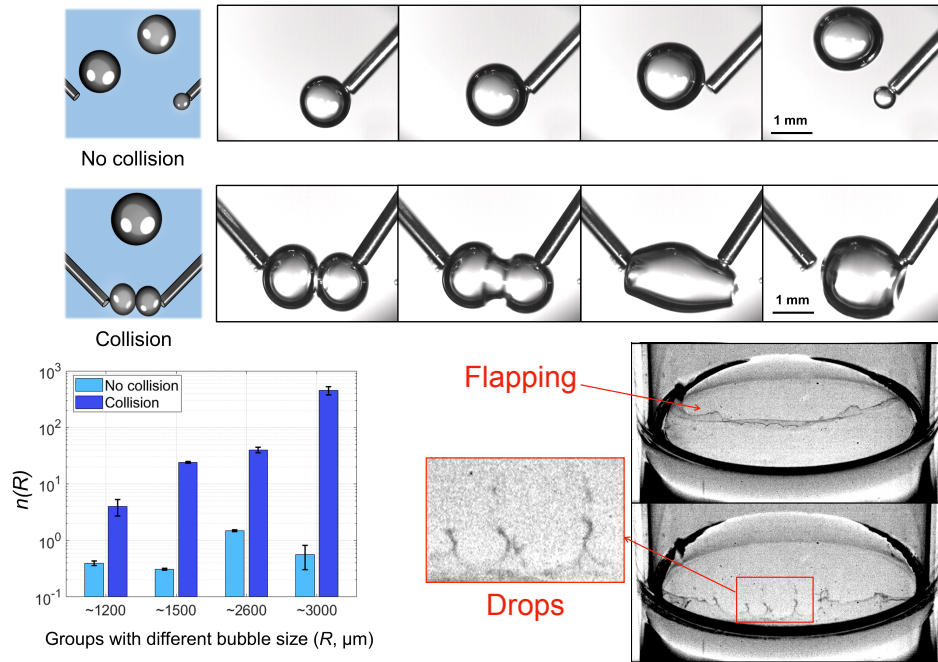


Figure 1: Assessing the dramatic effect of bubble collisions on droplets generation  $n(R)$ , and illustration of the microscopic phenomenon involved: The film squeezed between two colliding bubbles flaps at burst, and produces a fine mist within the coalesced bubble.

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<sup>1</sup>Jiang et al., *Submitted* (2024).