

Strong acoustic vibrations of bubbles within microfluidic devices or trees

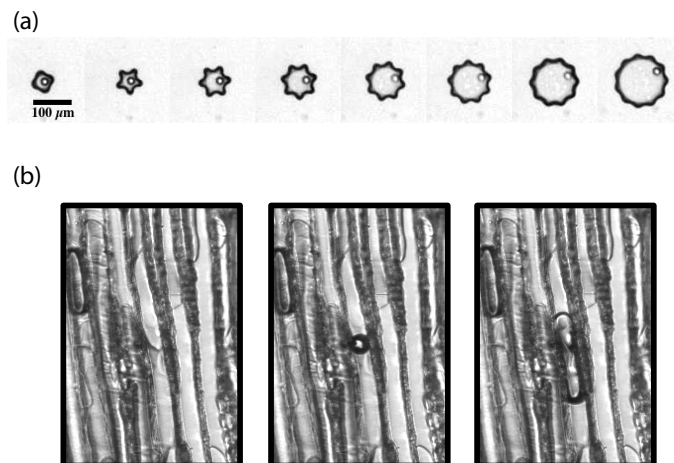
Ph. Marmottant¹, F. Mekki-Berrada¹, P. Thibault¹, O. Vincent¹, A. Ponomarenko¹ and D. Bienaimé¹

¹ *Laboratoire Interdisciplinaire de Physique, CNRS UMR 5588/Université Grenoble Alpes, France*

In this talk we will present unusual phenomena occurring in microfluidic bubbles and trees, linked to bubble vibrations.

First, we will present the vibration mode of bubbles flattened in microfluidic channel. Bubbles exhibit parametric shape modes that we can carefully investigate under ultrasound. A strong associated streaming occurs near vibrating bubbles, especially when bubbles are close to each other. This streaming would prove helpful to mix liquids.

Second we will present our investigations on the nucleation of bubbles in tree vessels, by showing experiments on wood and on leaves. Such explosive bubbles occur by cavitation, since the liquid sap in trees is under extreme negative pressure. They emit a characteristic sound and then form the start of an emboly that can affect the hydraulic circulation of sap.



(a) Bubble modes, (b) Nucleation of a bubble in a tree conduit.