Dipartimento di Fisica e Astronomia Galileo Galilei

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UNIVERSITÀ DEGLI STUDI DI PADOVA

## Wensday 6th october 2021 ore 11.00 – room "Voci"


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# Microstreaming around acoustically excited bubbles


Microbubbles which are used in medical ultrasound applications are known to induce microstreaming, a relatively slow mean flow with respect to the fast bubble oscillations. While microstreaming and its associated shear stresses are commonly agreed to play a role in the permeabilization of cell membranes, a detailed understanding of the induced flows is still missing. To acquire basic physical knowledge, my experimental work focused on the characterization of microstreaming induced around an air bubble in water, more precisely around a single acoustically trapped and excited, nonspherically oscillating bubble. For this, I correlated experimentally recorded microstreaming patterns to the time-resolved bubble dynamics. The surprisingly large number of pattern types can be classified to gather understanding of the physical mechanisms involved. The bubble size and the dominant surface mode number play an important role in the definition of the pattern types, but my analysis also revealed further parameters to take into account. In order to confirm the experimental findings, an analytical model has been developed and shows good agreement with the experimental results.