Abstract Submitted
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Galaxy-like organization of floaters at the air-water interface of Faraday waves[1] HÉCTOR ALARCÓN, NICOLAS PÉRINET, PABLO GUTIÉRREZ, Univ de Chile, LEONARDO GORDILLO, Univ of Minnesota - Twin Cities, NICOLÁS MUJICA, Univ de Chile — The fluid properties mismatch across an air-liquid interface allows to trap particles at it. These particles are called floaters and appear in nature at different scales: plankton, organic residues, and garbage, all relevant for the oceanic ecosystem. In static systems they tend to attract or repel each other, depending on their wetting properties and buoyancy [1]. When they are subjected to a flow, such as surface waves, they may drift and form structures at the interface [2]. In a recent work using PIV on Faraday waves, we have measured a streaming flow that emerges inside the bulk, leading to a slow circulation of fluid particles across the liquid [3]. The flow is mainly generated by the viscous shearing at the walls of the container. Our new experiments show that this flow has a remarkable effect on the drift of small hydrophilic particles (floaters), which leads to a rare arrangement of the floaters that resemble rotating galaxies. The forcing amplitude determines the galaxy shape, controlling the number and the length of its arms as well as its rotation velocity.
[1] Vella D. and Mahadevan L., Am. J. Phys. 73, 814 (2005)
[2] Sanli C. et al., Phys. Rev. E 89 (5), 053011 (2014)
[3] Périnet N. et al., http://arxiv.org/abs/1603.07353 (2016)

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Héctor Alarcón
Univ de Chile

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