ESPCI
Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05

Séminaire PMMH

Salle de réunion du PMMH, Campus Jussieu, Bâtiment Cassan A, 1 er étage

Vendredi 17 mai 2019, 11h00-12h00

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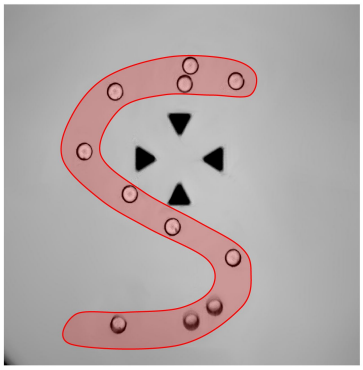
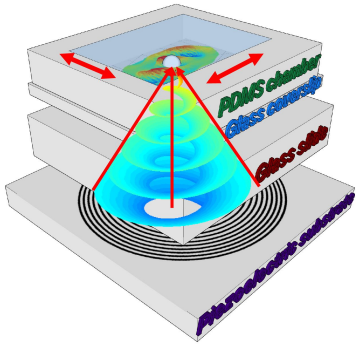
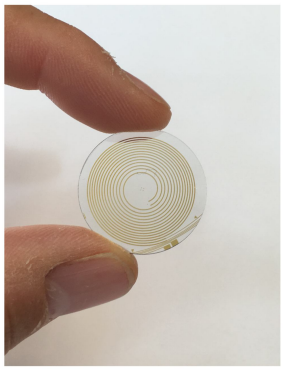
Manipulation of fluid and particles at microscales with selective acoustical tweezers

The selective contactless manipulation and assembly of physical and biological objects and fluids at micrometric down to nanometric scales promises tremendous development in fields as diverse as microrobotics, microfluidics, tissue engineering or micro/nano- medicine. In this regard, acoustical tweezers is a prominent technology since it is non-invasive, biocompatible label-free and enables trapping forces several orders of magnitudes larger than their optical counterparts at same actuation power, hence preventing deleterious heating. Yet, the widespread dissemination of this technology has been hindered by severe limitations of current systems in terms of selectivity and/or miniaturization and integrability. In this presentation, we will first introduce the the basic concepts behind fluid manipulation with acoustic waves. Then, we will discuss the latest developments in the field and in particular the emergence of selective acoustical tweezers based on some specific wave structure called acoustical vortices. We will show that it is now possible to manipulate selectively and in 3D particles at microscales, with flat, transparent, single electrodes acoustical tweezers, which can be easily be integrated in a standard microfluidic environment. We will also show that it is possible with these tweezers to generate some hydrodynamic vortices whose topology is controlled by the topology of the acoustic field.







Prochain séminaire : vendredi 24 mai 2019, Corrado Rainone (Univ. Amsterdam)
Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*
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