MASTER IN PHOTONICS – PHOTONICS BCN
EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April - September 2019

Laboratory : Clean Room, CNRE
Institution: UPC, MNT Group
City, Country : Barcelona, Spain

Title of the master thesis: Development of a liquid pixel based on reflective nanoparticles manipulation

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Summary of the subject :
Electrowetting is the change in wetability due to a electrostatic field. This effect is nowadays applied to the fabrication of liquid lenses (e.g. Varioptic or Amazon liquavista) for e-books and light beam focusing among others.
In this project we are going to analyse and fabricate the components involved in a 2D liquid lens, mainly studying the hydrophobic layer, the liquids involved and the sealing of the pixel (figure 1). Special attention will be taken with the possibility of adding silver nanoparticles to analyse the viability of developing reflectant pixels. COMSOL simulations will be made to develop a electrostatic-microfluidic model.

Objectives

- Learning electrospray technique.
- Deposition of hydrophobic/hydrophilic surfaces.
- Deposition of silver nanospheres.
- Pixel sealing
- Contact angle measurements.
- COMSOL simulations.

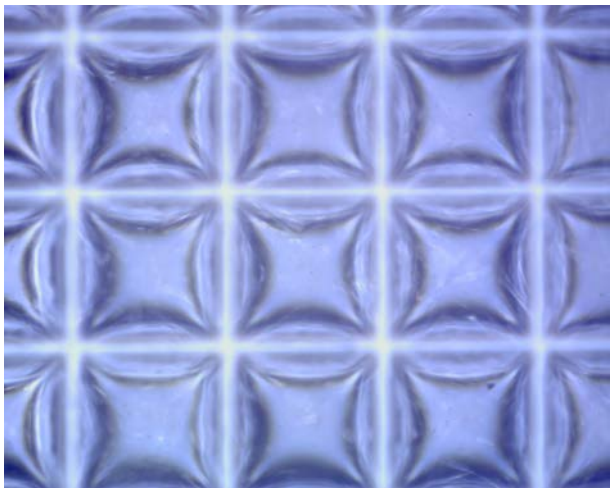

Figure 1: 500μmx500μm SU8 pixels filled up with water.

Keywords : EWOD, liquid pixel, silver nanoparticles