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# AVVISO DI SEMINARIO

**Lunedì 20 Novembre, alle ore 15:00**

**in Aula Malquori**

## il Prof. Matteo Pierno

Università di Padova, Dipartimento di Fisica e Astronomia "G. Galilei",
via Marzolo 8, 35131 Padova, Italy
e-mail: matteo.pierno@unipd.it

terrà un seminario dal titolo

# Drops and Emulsions moving on engineered surfaces

**Abstract**

The motion of drops on a solid surface attracts a lot of attention for its implications on microfluidics and wetting [1]. On a tilted surface, this motion is the result of a balance between the down-plane component of the drop weight and the viscous resistance, plus a capillary force related to the nonuniformity of the contact angle along the drop perimeter [2]. On Slippery Lubricated Surfaces (LIS) a suitable low surface tension lubricating liquid is trapped inside a surface texture [3]. This allows drops of an immiscible fluid to float on the lubricant layer with low friction, even for highly viscous solutions which otherwise would hardly move on solid surfaces [4]. We report the gravity-induced motion of small viscoelastic drops deposited on inclined lubricated surfaces (see Figure, left panels). Viscoelastic fluids made of Polyacrylamide (PAA) and Xanthan gum of sufficiently high N1 move down the tilted plane with an oscillating instantaneous speed whose frequency is found to be directly proportional to the average speed and inversely to the drop volume [5].

When emulsion drops are confined within microfluidic channel, their flow occurs via successive elastic deformations and plastic rearrangements which create fragile regions enhancing the "fluidization" of the material. Although it is known that the fluidization is strongly affected by the surface texturing, the role played by the density, the orientation and the periodicity of the rough elements has not been fully addressed [6,7]. We report experimentally and numerically the flow of

concentrated emulsions in microfluidic channels, one wall patterned with grooves having different patterns on the length scale of the droplets (see Figure, right panels) showing the evidence of different fluidization scenarios and directional effects [8-10].

**References**


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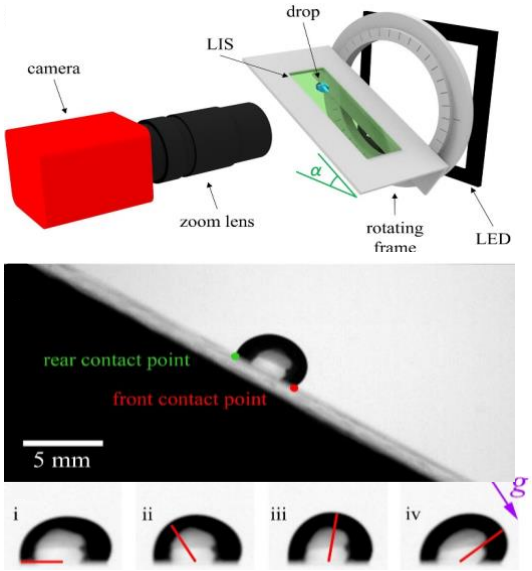


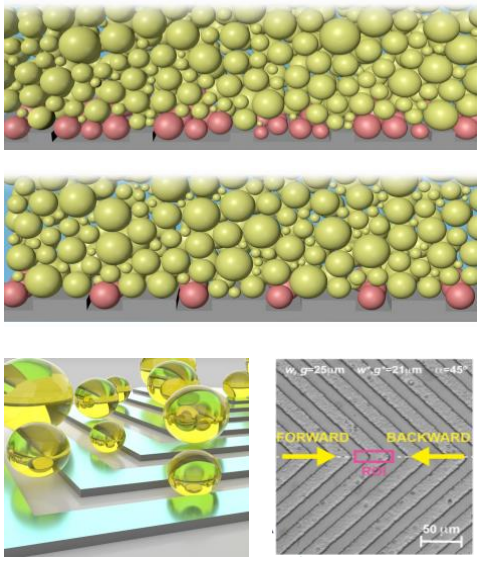


## Short Bio

Matteo Pierno is an associate professor at the University of Padua (Italy), working on transport phenomena in soft matter, particularly within microfluidics. He obtained an MS degree in Physics at the University of Milan (Italy) and a Ph.D. in Nuclear Engineering at the Milan Polytechnic. In 2004 he was a postdoctoral researcher at the University of Montpellier (France) for the Marie Sklodowska Curie Network on the arrested matter. In 2006 he received a European Reintegration Grant for working as a Marie Sklodowska Curie fellow within the National Center for Colloids and Surfaces (CSGI) on the self-assembly of DNA-labeled surfactants. In 2007 he joined the Department of Physics and Astronomy in Padua.