



MMM05: Drops and bubbles dynamics, capillarity, wetting and non-wetting phenomena.

Trapping of droplets on uneven liquid-infused surfaces

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Slippery liquid-infused porous surfaces (SLIPS) are known to make droplets remarkably mobile. Drops can slide away easily, making SLIPS widely used in water repellency or anti-fouling applications. However, the impact defects may have on droplet mobility has been underexplored. Here, we investigate the interaction between water droplets sliding on inclined SLIPS and step-like obstacles. We consider steps of intermediate height: much greater than the texture size and smaller than the drop size. We observe that even droplets, which are much larger than the obstacles, may get stuck on them (Fig. 1). By systematically varying droplet volume, obstacle height, and inclination angle, we uncover the conditions for this trapping. Only above a critical inclination angle do droplets clear the obstacles. We attempt to rationalise the dependence of this criterion on droplet and obstacle sizes.

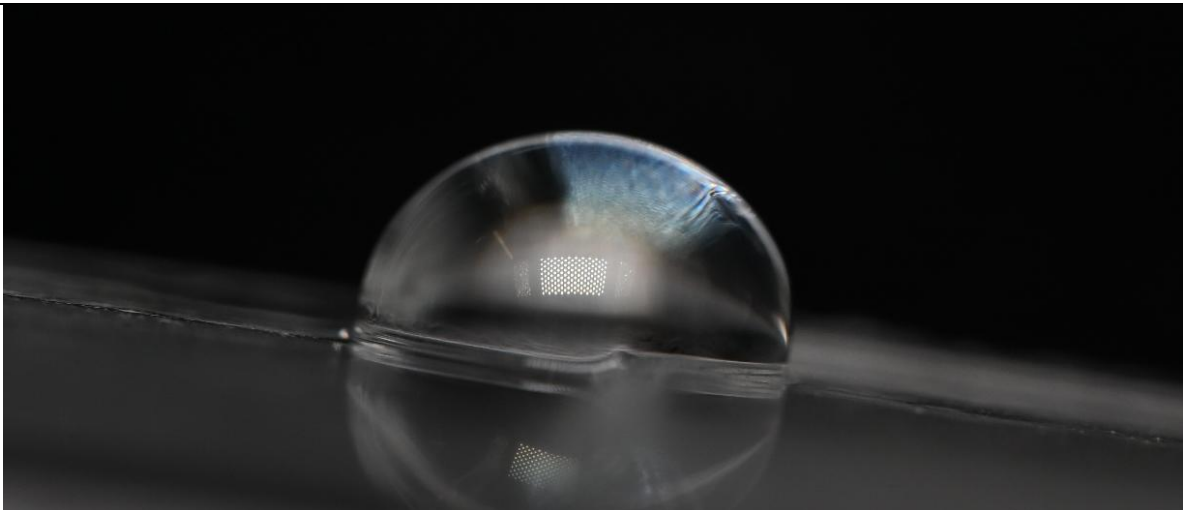


Figure 1. A 30 μL water droplet trapped on a 140 μm step on an 8° incline.