



Séminaire PMMH

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When honey moves faster than water

The viscosity of a fluid is well known to limit its flow : the more viscous a droplet, the slower it moves [1,2]. Here, we show that this intuitive rule breaks down in a confined liquid-repellent geometry. A gravity-driven, highly viscous glycerol droplet placed in a sealed superhydrophobic capillary moves more than 10 times faster than a low-viscosity water droplet [3]. This anomalous, viscosity-enhanced droplet motion is caused by a viscosity-suppressed deformation of the droplet-air interface. We find that the air film (plastron) trapped within the micro/nanostructure of the superhydrophobic coating plays an interesting and important role in controlling fluid flow beyond a mere reduction in contact area and friction.

- [1] D. Richard and D. Quéré, *Europhys. Lett.* 48 (1999).
- [2] T. Mousterde, P. S. Raux, C. Clanet, and D. Quéré, *Proc. Natl. Acad. Sci. USA* 116 (2019).
- [3] M. Vuckovac, M. Backholm, J. V. I. Timonen, and R. H. A. Ras, *Science Advances* 6 (2020).

