

Abstract Submitted
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Drop trampoline PIERRE CHANTELOT, MARTIN COUX, CHRISTOPHE CLANET, DAVID QUERE, PMMH, UMR 7636 du CNRS, ESPCI, Paris, France LadHyX, UMR 7646 du CNRS, Ecole polytechnique, Palaiseau, France — Superhydrophobic substrates inspired from the lotus leaf have the ability to reflect impacting water drops. They do so very efficiently and contact lasts typically 10 ms for millimetric droplets. Yet unlike a lotus leaf most synthetic substrates are rigid. Focusing on the interplay between substrate flexibility and liquid repellency might allow us to understand the dynamic properties of natural surfaces. We perform liquid marbles impacts at velocity V onto thin (~ 0.01 mm) stretched circular PDMS membranes. We obtain contact time reductions of up to 70%. The bouncing mechanism is drastically modified compared to that on a rigid substrate: the marble leaves the substrate while it is still spread in a disk shape as it is kicked upwards by the membrane. We show that the bouncing is controlled by an interplay between the dynamics of the drop and the membrane.

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