Supporting Information

Optically Guided Pyroelectric Manipulation of Water Droplet on a Superhydrophobic Surface

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Figures

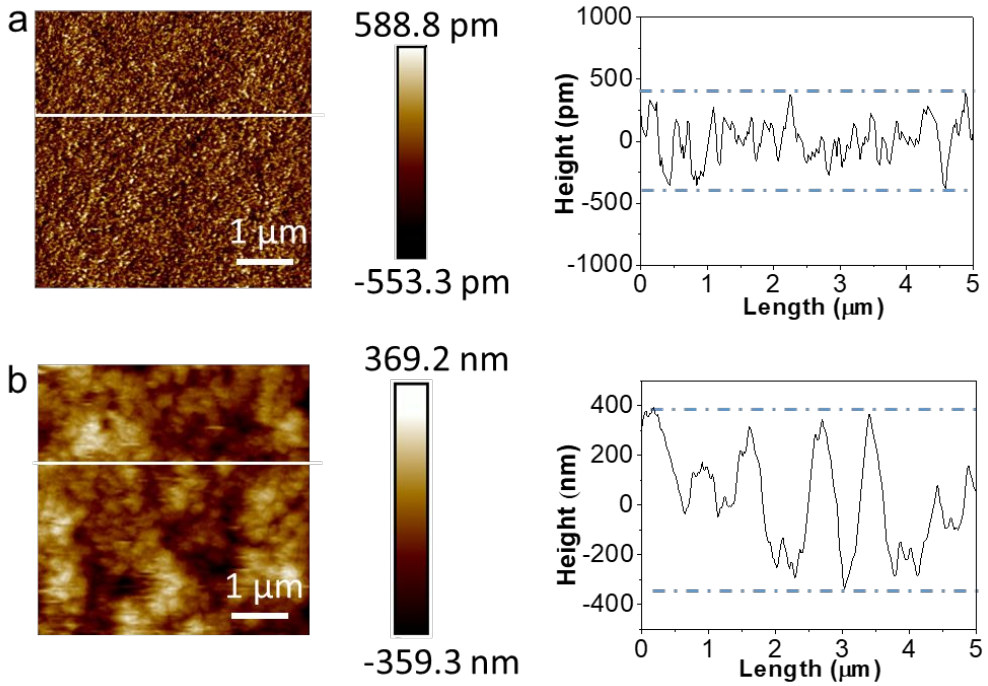

Figure S1. AFM images and typical line profiles (a) a blank $LiTaO_3$ and (b) the superhydrophobic layer coated on the $LiTaO_3$.

Figure S2. Water droplet elongation and detachment from the sample surface, leaving behind a tiny volume of daughter droplet pinned on the sample.

Optical configuration to heat the sample

The optical configuration of the light source to heat the sample is shown in Figure R2. We used a 1064 nm fiber laser as the light source to illuminate the sample. A microlens attached at the end of the fiber was used to focalize and collimate the laser beam. In some experiments, an aperture was used to further reduce the spot size such that selectively heating of a small area, e.g. inside a water droplet, can be achieved. The experimental setup is shown below. As 1064 nm laser is invisible, a laser detector card (Thorlabs) was used to monitor its center position.

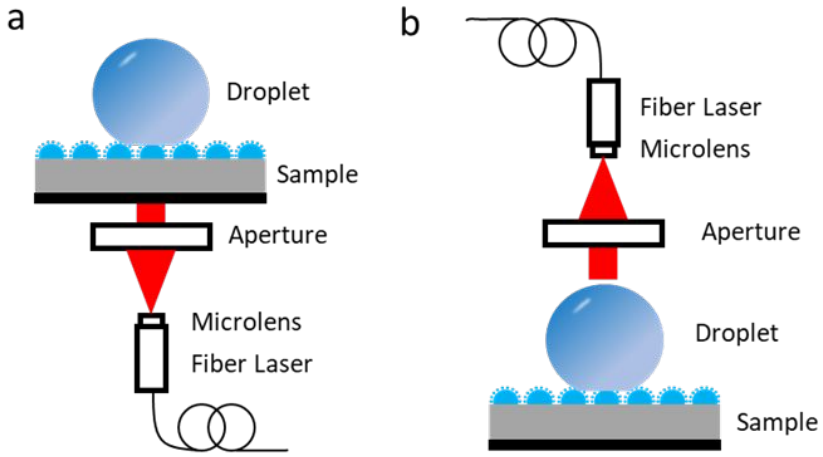

Figure S3. The optical configuration used to heat the sample. (a) laser illuminated from the bottom. (b) laser illuminated from the top.

Movie S1. Reversible wettability transition induced optically in silicon oil.

Movie S2. Droplet vertical elongation under laser illumination (spot size, Φ = 0.5 mm).

Movie S3. Droplet horizontal spreading followed by vertical elongation under laser illumination (spot size, Φ = 1.5 mm).

Movie S4. Droplet horizontal spreading under laser illumination (spot size, Φ = 2.5 mm).

Movie S5. "Taylor cone" formation when the pyroelectric voltage exceeds certain critical value.

Movie S6 Droplet stretching into a cylinder and breakup in silicone oil.

Movie S7. Droplet jetting vertically away from the sample surface.

Movie S8. Droplet deformation and jetting from the sample surface by off-axis illumination.

Movie S9. Droplet driven to move horizontally when the off-axis angle is ~60^{o}.

Movie S10. Droplet deforms asymmetrically and splits into two daughter droplets of different volumes.

Movie S11. Droplet optically pinned on a tilted surface.

Movie S12. Transferring of a water droplet diluted with Prussian blue by a laser-controlled pipette.