

Abstract Submitted  
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**Robust liquid-infused surfaces through patterned wettability** JASON WEXLER, ABIGAIL GROSSKOPF, MELISSA CHOW, YUYANG FAN, Princeton University, IAN JACOBI, Technion - Israel Institute of Technology, HOWARD STONE, Princeton University — Liquid-infused surfaces display advantageous properties that are normally associated with conventional gas-cushioned superhydrophobic surfaces. However, the surfaces can lose their novel properties if the infused liquid drains from the surface. We explore how drainage due to gravity or due to an external flow can be prevented through the use of chemical patterning. A small area of the overall surface is chemically treated to be preferentially wetted by the external fluid rather than the infused liquid. These sacrificial regions disrupt the continuity of the infused liquid, thereby preventing the liquid from draining from the texture. If the regions are patterned with the correct periodicity, drainage can be prevented entirely. The chemical patterns are created using spray-coating or deep-UV exposure, two economical techniques that are scalable to generate large-scale failure-resistant surfaces.

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