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Surface morphology and flow dynamics for fog harvesting FAN KIAT CHAN, University of Illinois, Urbana-Champaign, AIDA SHAHROKHIAN, HUNTER KING, University of Akron, MATTIA GAZZOLA, University of Illinois, Urbana-Champaign — Harvesting fog as a source of fresh water is a practical solution for inhabitants of foggy coastal deserts, whether human, animal or plant. Namib desert beetles famously lean their textured bodies into the fog-laden wind; their evolved strategy has been interpreted mostly in the context of surface wetting and its role in transporting of water as it is accumulated. However, little is known about how the interplay between flow dynamics and surface morphology affects droplet interception. From experiments with controlled flow and fog delivery and sensitive accumulation measurements as well as complementary numerical flow simulations, we find mechanisms for significant enhancement of collection efficiency on two scales: millimetric surface features which affect droplet trajectories; and microscopic features which aid evacuation of lubricating film before contact.

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