

Abstract Submitted  
for the OSS19 Meeting of  
The American Physical Society

**The Role of Surface Morphology in Aerodynamics of Biomimetic Fog Harvesting** AIDA SHAHROKHIAN, JIANSHENG FENG, HUNTER KING, The University of Akron — Harvesting water from atmospheric fog has been considered in regions where surface water is scarce. Namib desert beetles with bumpy elytra in this context have been frequently cited as a source of biological inspiration in a narrative where the difference in wetting properties of the bumps and the valleys accelerates the transport of accumulated water to the mouth of the beetle. However, the accumulation step depends solely on fluid dynamics. In this study, using a custom wind tunnel, we investigate how bumps as aerodynamic features take advantage of the competition between drag and inertia of the fog droplets to induce collisions. Results indicate that even slight modification of the surface morphology can play a significant role. Here we show that by addition of millimetric bumps the efficiency increases to three times the efficiency of a smooth surface of identical wettability.

Aida Shahrokhian  
The University of Akron

Date submitted: 17 Mar 2019

Electronic form version 1.4