

Abstract Submitted  
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**Shallow fluids meets Einstein: an experimental geodesic flow on a curved space** JAY JOHNSON, JEAN-LUC THIFFEAULT, University of Wisconsin - Madison — When a shallow layer of inviscid fluid flows over a smoothly-patterned substrate, the fluid particle trajectories are, to leading order in the layer thickness, geodesics on the two-dimensional curved space of the substrate. We use 3D-printed substrates to show that the pattern made by a jet striking a bumpy surface is described by the geodesic equation. Because the geodesic equation is fourth order, the geodesics are chaotic even for simple substrates.

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