

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Creating a urine black hole RANDY HURD, Utah State University, ZHAO PAN, Brigham Young University, ANDREW MERITT, Utah State University, JESSE BELDEN, Naval Undersea Warfare Center, Newport, TADD TRUSCOTT, Utah State University — Since the mid-nineteenth century, both enlisted and fashion-conscious owners of khaki trousers have been plagued by undesired speckle patterns resulting from splash-back while urinating. In recent years, industrial designers and hygiene-driven entrepreneurs have sought to limit this splashing by creating urinal inserts, with the effectiveness of their inventions varying drastically. From this large assortment of inserts, designs consisting of macroscopic pillar arrays seem to be the most effective splash suppressers. Interestingly this design partially mimics the geometry of the water capturing moss *Syntrichia caninervis*, which exhibits a notable ability to suppress splash and quickly absorb water from impacting rain droplets. With this natural splash suppressor in mind, we search for the ideal urine black hole by performing experiments of simulated urine streams (water droplet streams) impacting macroscopic pillar arrays with varying parameters including pillar height and spacing, draining and material properties. We propose improved urinal insert designs based on our experimental data in hopes of reducing potential embarrassment inherent in wearing khakis.

Tadd Truscott
Utah State University

Date submitted: 30 Jul 2015

Electronic form version 1.4