

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Droplet impact patterns on inclined surfaces with variable properties¹ MICHAEL LOCKARD, G. PAUL NEITZEL, MARC K. SMITH, Georgia Inst of Tech — Bloodstain pattern analysis is used in the investigation of a crime scene to infer the impact velocity and size of an impacting droplet and, from these, the droplet's point and cause of origin. The final pattern is the result of complex fluid mechanical processes involved in the impact and spreading of a blood drop on a surface coupled with the wetting properties of the surface itself. Experiments have been designed to study these processes and the resulting patterns for the case of a single Newtonian water droplet impacting a planar, inclined surface with variable roughness and wetting properties. Results for Reynolds numbers in the range of (9,000 – 27,000) and Weber numbers in the range of (300 – 2,600) will be presented. Transient video images and final impact patterns will be analyzed and compared with results from traditional bloodstain pattern-analysis techniques used by the forensics community. In addition, preliminary work with a new Newtonian blood simulant designed to match the viscosity and surface tension of blood will be presented.

¹Supported by the National Institute of Justice.

G. Neitzel
Georgia Inst of Tech

Date submitted: 01 Aug 2014

Electronic form version 1.4