



American  
Physical  
Society

One Physics Ellipse  
College Park, MD 20740-3844  
[www.aps.org](http://www.aps.org)

For Immediate Release:  
Nov. 18, 2011

Contact: Charles E. Blue  
(301) 209-3091

### **Engineers Devise Shoe Sampling System for Detecting Trace Amounts of Explosives**

Baltimore, Md. – The ability to efficiently and unobtrusively screen for trace amounts of explosives on airline passengers could improve travel safety – without invoking the ire of inconvenienced fliers. Toward that end, mechanical engineer and fluid dynamicist Matthew Staymates of the National Institute of Standards and Technology in Gaithersburg, Maryland, and colleagues have developed a prototype air sampling system that can quickly blow particles off the surfaces of shoes and suck them away for analysis.

The NIST engineers developed several different versions of the system. “One particular device is a kiosk-style instrument that people step into, never having to physically remove their shoes for sampling,” Staymates explains. “Air jets are located in strategic locations and used to dislodge particles from the shoe surface, and a large blower establishes a bulk flow field that ensures all liberated particles are transported in the appropriate direction.”

In order to be used commercially, the sampling system – which can collect particles in just 6 to 7 seconds – would have to be combined with a particle collection device and a chemical analyzer, Staymates says: “Incorporating a particle collection device and chemical analyzer would certainly be possible in the current prototype, but it was outside of the scope of the project. NIST’s role was to uncover the fundamental connection between fluid dynamics and trace aerodynamic sampling, and use our findings to help in the development of next-generation sampling approaches.” Creating a finished marketable device, he says, is “a job for private industry.”

Staymates will describe the prototype device in a talk at the *APS Division of Fluid Dynamics Meeting*, which will take place Nov. 20-22, 2011, at the Baltimore Convention Center in the historic waterfront district of Baltimore, Maryland. The talk, “Design and characterization of an aerodynamic shoe sampling system for screening trace explosive materials,” is at 10:56 a.m. on Monday, Nov. 21, in Room 312.

Abstract: [http://absimage.aps.org/image/MWS\\_DFD11-2011-000062.pdf](http://absimage.aps.org/image/MWS_DFD11-2011-000062.pdf).

# # #

## **MORE MEETING INFORMATION**

The 64th Annual DFD Meeting is hosted by the Johns Hopkins University, the University of Maryland, the University of Delaware and the George Washington University. Howard University and the U.S. Naval Academy are also participating in the organization of the meeting. It will be held at the Baltimore Convention Center, located in downtown Baltimore, Md. All meeting information, including directions to the Convention Center, is at:

<http://www.dfd2011.jhu.edu/index.html>

## **USEFUL LINKS**

Main Meeting Web Site: <http://www.dfd2011.jhu.edu/index.html>

Search Abstracts: <http://meeting.aps.org/Meeting/DFD11/Content/2194>

Directions and Maps: <http://www.dfd2011.jhu.edu/venuemaps.html>

## **PRESS REGISTRATION**

Credentialed full-time journalists and professional freelance journalists working on assignment for major publications or media outlets are invited to attend the conference free of charge. If you are a reporter and would like to attend, please contact Charles Blue ([cblue@aip.org](mailto:cblue@aip.org), 301-209-3091).

## **SUPPORT DESK FOR REPORTERS**

A media-support desk will be located in the exhibit area. Press announcements and other news will be available in the Virtual Press Room (see below).

## **VIRTUAL PRESS ROOM**

The APS Division of Fluid Dynamics Virtual Press Room features news releases, graphics, videos, and other information to aid in covering the meeting on site and remotely. See:

<http://www.aps.org/units/dfd/pressroom/index.cfm>