



American
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***APS Division of Fluid Dynamics Meeting:
Highlights and Media Registration Baltimore, Maryland, Nov. 20-22, 2011***

FOR IMMEDIATE RELEASE

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Supernovas, the Swirling of Wine, Heart Valves, Mary Poppins' Umbrella and Other Surprising Insights into Flight, and More

The 64th Annual Meeting of the American Physical Society's (APS) Division of Fluid Dynamics (DFD) will include more than 2,000 compelling presentations from across the physical sciences, engineering, and medicine. Topics include: explosions -- from tiny experiments to massive stars; the quirks of flying; why coffee spills; and how rain contributes to the spread of disease among plants.

The meeting will take place November 20-22, 2011, at the Baltimore Convention Center in the historic waterfront district of Baltimore, Maryland. Reporters are invited to attend the conference free of charge. Registration instructions and other information may be found at the end of this news release.

Preliminary Meeting Highlights

SUNDAY, NOVEMBER 20

Fluid Dynamics of Bottle Filling: From large bottles with shampoos and cleaners to small bottles found in the pharmaceutical industry, the filling of bottles is a widely practiced operation in a large number of industries. Researchers will present a primarily computational study of the fluid dynamical challenges that can arise during the rapid filling of bottles.

<http://meeting.aps.org/Meeting/DFD11/Event/153890>

How Mosquitos Fly in the Rain: Raindrops are 50 times heavier than mosquitoes, yet the pesky insects still manage to thrive during rainfall and high humidity. High-speed video reveals that even a bull's-eye raindrop hit simply pushes past, letting mosquitos buzz along to find their next meal.

<http://meeting.aps.org/Meeting/DFD11/Event/153906>

From a Slow Burn to Supersonic Detonation: The transition from deflagration – a subsonic flame – to a supersonic detonation can occur in environments ranging from experimental and industrial systems on Earth to astrophysical thermonuclear supernovae explosions.

<http://meeting.aps.org/Meeting/DFD11/Event/154298>

Mary Poppins' Umbrella and the Importance of Being Top-heavy in Flapping Flight: By creating a model system that consists of a pyramid-shaped object hovering in a vertically oscillating airflow, researchers explore how bugs and other flapping flyers use their top-heavy builds to stay aloft.

<http://meeting.aps.org/Meeting/DFD11/Event/153913>

Wind Resource Evaluation for Optimized Wind Energy: As part of a special focus session on wind energy fluid dynamics, researchers evaluate wind resources in order to understand how an array of vertical-axis wind turbines extracts energy from wind.

<http://meeting.aps.org/Meeting/DFD11/Event/154097>

MONDAY, NOVEMBER 21

Walking with Coffee: When and Why It Spills: In our busy lives, almost all of us have to walk with a cup of coffee. Needless to say, under certain conditions we spill that precious liquid. This is a common example of the interplay between the complex motion of a walking individual and the fluid dynamics of a low viscosity liquid contained in a cup.

<http://meeting.aps.org/Meeting/DFD11/Event/154769>

Why Do Things Splash?: The splashing of a droplet when impacting a solid surface is a common, everyday occurrence, but the mechanism for splashing is not well understood. A new analysis gives insight into the subtle dynamics of the splash.

<http://meeting.aps.org/Meeting/DFD11/Event/154640>

Rainfall Suspected Culprit in Leaf Disease Transmission: Rainfalls are suspected to trigger the spread of a multitude of foliar diseases, which could be devastating for agriculture and forestry. Experimental and modeling data shed light on this mode of disease transmission.

<http://meeting.aps.org/Meeting/DFD11/Event/155026>

Sampling Shoes Aerodynamically to Screen for Explosive Materials: Researchers are developing a prototype shoe sampling system that relies on aerodynamic sampling to detect explosive contamination. A new study reveals the fluid dynamics of the proposed system.

<http://meeting.aps.org/Meeting/DFD11/Event/154681>

Water Balloon Bursts! The Science behind the Fun: Throw a water-filled balloon on a rigid surface, pop it with a pin, hold it under water or suspend it in the air. In each case, three dynamic forces conspire to spill the contents in dramatic form.

<http://meeting.aps.org/Meeting/DFD11/Event/153802>

Eggs in Milk: The Conclusion: A hard-boiled egg spinning on a countertop and passing through a puddle of milk draws milk up the side of the egg and then ejects it at the maximum radius. Experimental results are presented on this phenomenon. <http://meeting.aps.org/Meeting/DFD11/Event/154451>

Nanowires Provide Power for Swimming: A new nanowire motor exploits the flexibility of nanowires for propulsion, with potential biomedical applications.

<http://meeting.aps.org/Meeting/DFD11/Event/154391>

Hydrodynamics of Wine Swirling: A crucial step in wine tasting is the so called “swirling,” necessary to release the bouquet of the wine. This same action is equally crucial in a host of other physics and biology experiments and assays. A new model sheds light on the process.

<http://meeting.aps.org/Meeting/DFD11/Event/154750>

TUESDAY, NOVEMBER 22

Robotic Jellyfish Shows Its Moves: An unmanned underwater vehicle named Robojelly was inspired by actual jellyfish morphology. Researchers used its lifelike properties to analyze the mysterious finer points of jellyfish propulsion.

<http://meeting.aps.org/Meeting/DFD11/Event/155920>

Artificial Heart Valves: Better Shapes Mean Better Flow: Mechanical heart valves are extremely important medical devices, yet they are far from ideal. A new prototype with an asymmetric design more closely matches the properties of a natural, healthy heart valve.

<http://meeting.aps.org/Meeting/DFD11/Event/155922>

Supernovas: How Turbulence and Combustion Combine in Stellar Explosions: Type 1a supernovas are cosmic distance markers, so understanding their inner workings is essential for establishing the cosmic yardsticks. New full-star 3-D calculations provide new insights on these cosmic explosions.

<http://meeting.aps.org/Meeting/DFD11/Event/155293>

Bubbles in Drops: From Cavitation to Exploding Stars: In a microgravity experiment, researchers generated single cavitation bubbles inside nearly spherical water drops. They will discuss the possible analogies with various astrophysical processes from our own Sun to asymmetric supernovae.

<http://meeting.aps.org/Meeting/DFD11/Event/155581>

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, Maryland. 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, 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 will be launched in mid-November and will feature 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>

GALLERY OF FLUID MOTION

Every year, the APS Division of Fluid Dynamics hosts posters and videos that show evocative images and graphics from either computational or experimental studies of flow phenomena. The outstanding entries are selected for their artistic content, originality, and ability to convey information. They will be honored during the meeting, placed on display at the 2012 APS March Meeting, and appear in the annual Gallery of Fluid Motion article in the American Institute of Physics' journal, *Physics of Fluids*.

Selected entries from the Gallery of Fluid Motion will be hosted as part of the Fluid Dynamics Virtual Press Room. In mid-November, when the Virtual Press Room is launched, another announcement will be sent out.

ABOUT THE APS DIVISION OF FLUID DYNAMICS

The Division of Fluid Dynamics of the American Physical Society (APS) exists for the advancement and diffusion of knowledge of the physics of fluids with special emphasis on the dynamical theories of the liquid, plastic and gaseous states of matter under all conditions of temperature and pressure. See: <http://www.aps.org/units/dfd/>