



Dupont Summit 2016

Science, Technology, and Environmental Policy

December 2, Historic Whittemore House, Washington, DC

Presentation

“From Fire Whirls to Blue Whirls and Combustion With Reduced Pollution”

The growing worldwide demand to reduce emissions from combustion calls for development of alternative technologies for high-efficiency and low-emission combustion. Whereas fire whirls are known for their intense and disastrous threat to life and surrounding environments, their swirl properties and thus higher combustion efficiency imply an unexploited potential for highly efficient, low-emission combustion. In studying fire whirls over water for oil-spill cleanup, we discovered a beautiful, swirling flame phenomenon, the “blue whirl,” which evolves from a fire whirl and burns with nearly soot-free combustion. Understanding and control of the blue whirl and its predecessor, the fire whirl, will suggest new ways for fuel-spill remediation, reduced-pollution combustion, and fluid mechanics research. This talk will present an evolution of the discovery, beginning with observations of large fire whirls arising from a large spill of Bourbon from the Jim Beam distillery in Kentucky in 2013, to the concept of cleaning up oil spills with fire whirls, to the surprising discovery of the blue whirl in 2015. The consequences of this discovery and possible uses will be covered along with a question-and-answer period with the authors.

Presenters

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