



Weekly Seminar

The Secret of Splashing



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Time: 4:00pm, July. 3, 2013 (Wednesday)

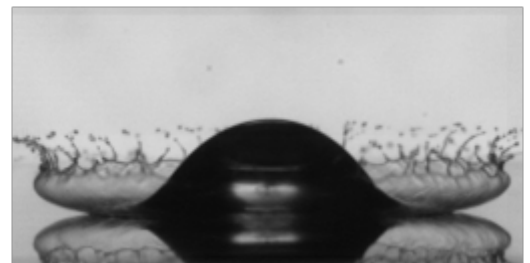
时间: 2013年7月3日 (周三) 下午4:00

Venue: Room 607, Science Building 5

地点: 理科五号楼607会议室

Abstract

What causes the splashing when a liquid drop hits a solid surface? Recently we have discovered a striking phenomenon: on a smooth surface, splashing can be completely suppressed by decreasing the pressure of the surrounding gas. The threshold pressure where a splash first occurs is measured as a function of the impact velocity and found to depend on the molecular weight of the gas and the viscosity of the liquid. Both experimental scaling relations support a model in which the compressibility of the gas is responsible for creating the splashing. We also studied splashing on rough surfaces and found two distinct contributions to a splashing. One is caused by air and has the same characteristics as the “coronal” splash observed on smooth substrates. A second, “prompt” splash, contribution is caused by surface roughness. Further experiments on textured-surfaces show that the direction and amount of splashing can be controlled by the textured-surface patterns. These discoveries provide new evidence for the fundamental mechanism of splashing and might find important applications in many splashing-related industrial processes.



About the Speaker

Xu, Lei received BS degree in Physics from the University of Science & Technology of China (USTC) in 2000, and Ph.D. degree from Physics Department, The University of Chicago in 2006. After three years of postdoc research in the School of Engineering and Applied Sciences (SEAS) in Harvard University, he became an assistant professor in Department of Physics, The Chinese University of Hong Kong since 2009. His research interests cover soft matter, fluid mechanics, and complex fluids.