

Departmental Lecture Series: March 7, 2022, 12:00 Noon

Bursting soap bubbles – fun or science?

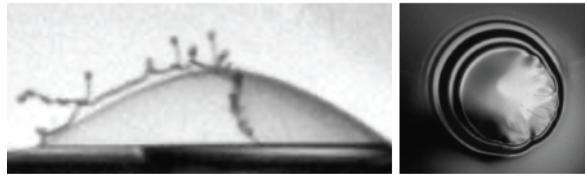
Uddalok Sen, PhD

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Abstract:

Floating soap bubbles are often a sight to behold, particularly due to the plethora of colors they demonstrate as light gets reflected from the soap film. However, soap bubbles (or films) are inherently ephemeral, and burst soon after they are formed – often to the disappointment of the mesmerized observer.

Interestingly, this bursting phenomenon itself is rich in physics, and has fascinated fluid dynamicists for nearly two centuries. Despite the long history of studying this bursting phenomenon, several key questions are still unanswered; in particular, what role, if any, the ambient plays in the physics of bursting. In this talk, I will revisit this age-old problem, with an emphasis on studying the influence of the ambient on the physics of bursting soap bubbles. I will show that high-speed imaging reveals new scalings in the dynamics of bursting films in an ambient, which can be further explained through scaling analysis and numerics. The findings of this talk are not only of fundamental importance, but are also relevant in understanding, and thus mitigating, oil spills in oceans and the spread of respiratory diseases via aerosols.



Author Bio:

Uddalok Sen is a soft matter physicist who completed his Bachelor of Mechanical Engineering in 2014 from Jadavpur University, India, as a recipient of four university endowed medals, and subsequently worked as a Junior Research Fellow in the same institute. He completed his Master of Science, and then earned a Doctor of Philosophy in Mechanical Engineering from the University of Illinois at Chicago, USA in 2017 and 2019, respectively. During his graduate studies, he was the recipient of several awards and fellowships including the Faydor Litvin Graduate Award, Chicago Consular Corps Scholarship, American Physical Society Division of Fluid Dynamics Travel Award, UIC Graduate Student Council Travel Award, Provost's Award for Graduate Research, and the highly prestigious Dean's Scholar Fellowship. He is currently working as a Postdoctoral Researcher in the Physics of Fluids group at the University of Twente, The Netherlands. Later in 2022, he will be joining Technical University of Darmstadt, Germany as a Alexander von Humboldt Postdoctoral Research Fellow. Uddalok's research interests include interfacial flows of rheologically-complex fluids including, but not limited to, droplets, jets, bubbles, and films, soft elastic solids, and motion of confined biological active matter.



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Venue: Power Engineering Seminar Room, 2nd Floor

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