Amundson Lecture Series 2026

The University of Houston is honored to host a series of lectures by Howard A. Stone in recognition of Professor Neal Amundson

General Audience Lecture & Reception
Tuesday, March 24th, 2026. UH Alumni Center – O'Quinn Great Hall
4:00—5:00 P.M. Lecture | 5:00—6:00 P.M. Reception
Fluid Mechanics Everywhere: Surprises, Beauty, and Endless Applications

In this talk, I will illustrate the beauty of fluid mechanics as an intellectual discipline while highlighting the remarkable breadth of applications informed by its principles. I will introduce concepts such as self-similarity, thin-film flows, and Marangoni motions (flows driven by surface tension gradients), as well as connections to biology and medicine. Throughout the talk, I will weave together experiments, physical understanding, and mathematics to inspire new fluid-mechanical insights and applications.

Technical Sessions (Wednesday, March 25th, 2026):

Graduate Seminar. Honors College – The Commons
10:00—11:00 A.M. Seminar (coffee at 9:40 A.M.)
Thin-Film Flows and Marangoni Motions from the Perspective of Self-Similarity

One beautiful theme that connects the study of partial differential equations to a wide variety of physical problems is self-similarity. Traditional similarity solutions typically involve nonlinear partial differential equations with two independent variables—for example, capillary (surface-tension-driven) flows in narrow wedges. I will describe such cases and then present an experimentally motivated similarity solution involving three independent variables, for which we construct an analytical solution that agrees well with measurements. Finally, I will discuss new examples of surfactant spreading at interfaces, where the mathematical description requires the study of self-similar solutions of the complex-valued Burgers equation.

Colloquium & Reception. Student Center – Multipurpose Room
3:00—4:00 P.M. Colloquium | 4:00—5:00 P.M. Reception
Physicochemical Hydrodynamics: Intersections of Fluid Mechanics and Physical Chemistry with Applications to Biological Condensates

The principles of fluid dynamics and physical chemistry apply to a wide range of biophysical and soft matter systems. One modern area of intersection is biological condensates, also known as membraneless organelles. I will introduce this topic and connect it to the formation of the spindle in a dividing cell—a fundamental aspect of molecular biology. I will discuss experiments documenting a condensed protein phase on growing microtubules, followed by the appearance of the Rayleigh-Plateau instability, which produces discrete droplets along a 25-nanometer-diameter microtubule. These drops drive branching nucleation, an important mechanism for spindle development, and can cause capillary-driven bundling of microtubules—a mechanism distinct from conventional views of molecularly controlled bundling. Finally, I will describe a mathematical model for the response of molecular rotors used to measure the viscosity of biological membranes.

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For more information about the series, visit:
https://www.uh.edu/nsm/math/news-events/seminars-events/amundsonlectureseries/