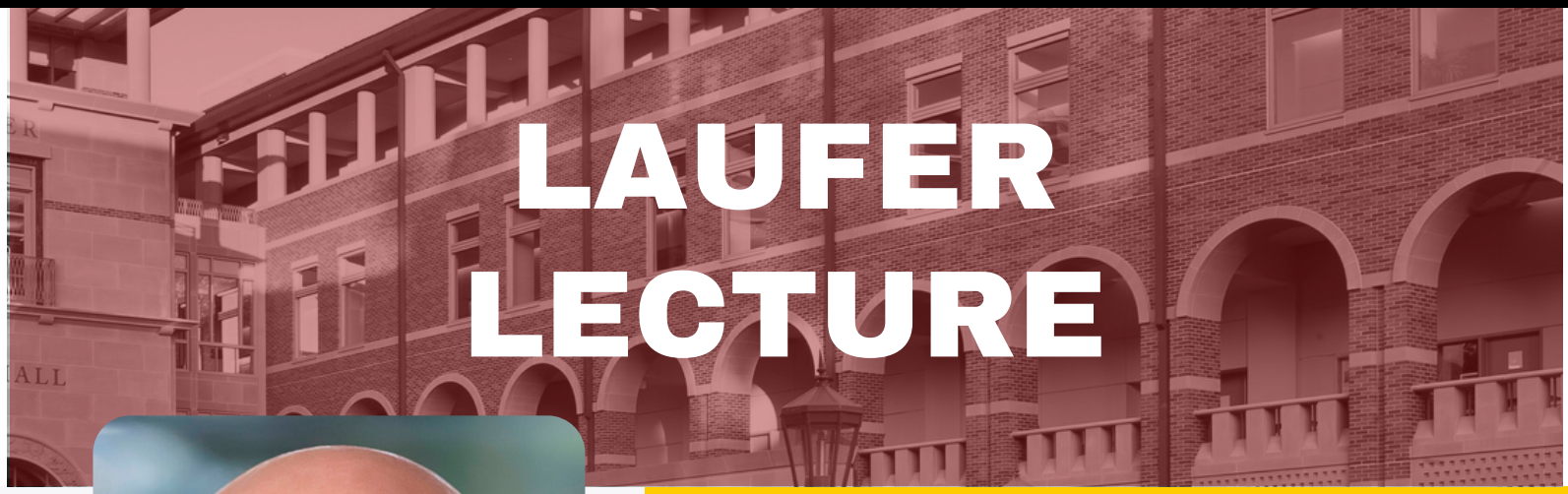
USC Viterbi

Department of
Aerospace & Mechanical Engineering



LAUFER LECTURE

HOWARD STONE

Donald R. Dixon '69 and Elizabeth W. Dixon Professor
Department of Mechanical and Aerospace Engineering
Princeton University

Thin-Film Flows: From Similarity Solutions to New Insights in Molecular Biology

Fluid mechanics has a rich history, as of course does mechanics more generally. The ideas bridge science and engineering disciplines, even as they generate new fundamental research questions in fluid mechanics. In this talk I sketch some recent themes* from my research group, which bridge a wide range of length scales. First, I give a brief survey of some of the fluid mechanics problems that we have been investigating in recent years. Second, whereas traditional similarity solutions in course work and research typically involve nonlinear equations with two independent variables, I will illustrate an experimentally motivated similarity solution involving three independent variables, for which we construct an analytical solution that can be compared with experimental measurements. Third, I discuss the formation of the spindle in a dividing cell, which is a fundamental aspect of molecular biology. Experiments documenting a condensed protein phase on growing microtubules are reported, followed by the appearance of the Rayleigh-Plateau instability, which produces discrete droplets along a microtubule: the drops drive branching nucleation, which is an important mechanism for the developing spindle.

WEDNESDAY, AUG 30 @ 12:00 PM

Tutor Campus Center, 3rd Floor, TCC 350

Reception will begin at 12 noon.
Seminar immediately after the reception.