Date: **October 8th**

Time: **10:30 AM**

Location: **Olin 305**

Speaker: **Dr. Paul Dimotakis**
California Institute of Technology

Title: **"Progress On Growth and Mixing of Rayleigh-Taylor Instability Flows"**

Abstract

This seminar will focus on growth and mixing in flow driven by the Rayleigh-Taylor instability (RTI) between two incompressible, miscible fluids. Based on DNS of the Navier-Stokes equations, augmented by a species transport-diffusion equation, with various initial perturbations, flows that achieved outer-scale Reynolds numbers, based on mixing-zone height and its rate of growth, in the range of 3000 to 3700 will be discussed. Initial overall growth is found to be diffusive and independent of the initial perturbations. Following the diffusive-growth stage, growth rates are found to depend on the initial perturbations, through the end of the simulations. Mixing is found to be even more sensitive to initial conditions than growth rates. Taylor microscales and Reynolds numbers are anisotropic throughout the simulations. Improved collapse of many statistics is achieved if the height of the mixing zone, rather than time, is used as the scaling or progress variable. Mixing has dynamical consequences for this flow, since it is driven by the action of the imposed acceleration field on local density differences. Isodensity and conditional mixing-rate statistics for this flow will also be discussed. More recent LES-SGS simulations based the stretched-vortex model of Pullin and co-workers have extended the Reynolds number regime studied and will also be discussed.