



# *Recent studies of Rayleigh-Taylor-driven turbulent mixing in multi-component flows*

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The Rayleigh-Taylor instability (RTI) is a turbulent fluid instability that drives mixing between two fluids when the denser fluid is accelerated into the lighter one. The RTI plays an important role in numerous natural and engineered systems including inertial confinement fusion, astrophysics, and atmospheric and oceanic flows. In each of these applications, RTI-driven mixing acts over a vast range of scales, underscoring the need for a thorough understanding of the mechanisms that drive the flow and for robust models to describe its influence in predictive simulations. This talk presents recent investigations into the turbulent RTI utilizing high-fidelity simulations alongside comparisons with targeted experimental datasets. These studies examine turbulence budget equations in RTI flows, evaluate and refine Reynolds-Averaged Navier-Stokes models to describe these classes of flows, and explore novel statistical descriptions of multi-component RTI mixing.

**FRIDAY, 8 August 2025, 11:00AM**

**Refreshments 10:45PM**

**Please also join colleagues for refreshments and informal discussion after the seminar until 12:30PM**

NCAR-Foothills Laboratory, 3450 Mitchell Lane

FL2-1022, Large Seminar

**Seminar will also be live webcast**

**<https://sundog.ucar.edu/public/page/MMM>**

Participants may ask questions during the seminar via Slido.