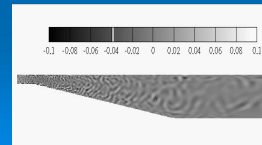
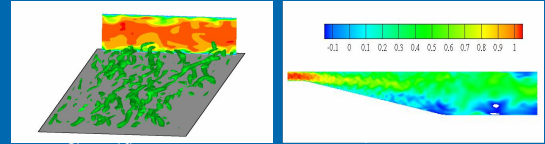


# Computational Aeroacoustics

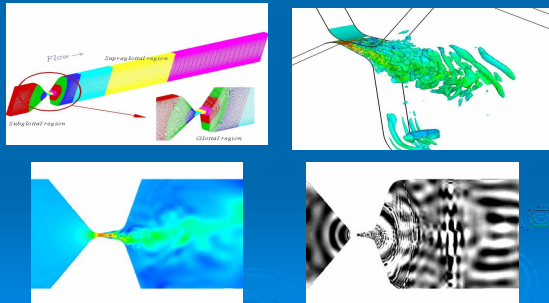
Prof. S. H. Frankel, ME  
<http://ristretto.ecn.purdue.edu>

## Aeroacoustics of Wall-bounded and Separated Turbulent Flows



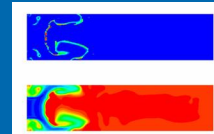
Large Eddy Simulation (LES) combined with accurate and efficient numerical methods allow aeroacoustics simulations of low Mach number turbulent flows

## Aeroacoustics in a Model of the Human Vocal Tract (NIH)

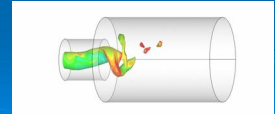


## Swirl Combustor Aeroacoustics

- Low pollutant emission combustors employ swirl for flame stabilization
- Coupling between unsteady heat release and duct acoustic modes may lead to combustion instability
- Ability to predict unsteady flame dynamics and coupled acoustic response critical e.g. PVC pressure fluctuations
- LES with premixed flame model



Swirl flame (top); flow (bottom)



Precessing vortex core (PVC)