

# UT Jet Propulsion Laboratory



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## Aeroelasticity

### Concern:

- Shock Associated Flutter, Effect of Flow Separation
- Active Flutter Suppression
- Flow-structure Coupled Phenomena in Aeroelasticity
- PSP Measurement of Unsteady Blade Pressure

### Approach:

- Experiments in Transonic Linear Cascade Tunnel
- CFD Analysis

## Compressor Aerodynamics

### Concern:

- 3D Unsteady Flow Behavior in Rotor-Stator Configuration
- Rotating Stall and Casing Treatment Effect
- Flow Characteristics in Humid Air Compressor
- Radial Compressor Flow of Supercritical CO<sub>2</sub>

### Approach:

- Experiments in 3-Stage Model Compressor and Cascade Tunnel
- CFD Analysis

## Aeroacoustics

### Concern:

- Suppression of Jet Noise by Micro Jet Injection
- Broadband Fan Noise

### Approach:

- Experiments in Anechoic Chamber
- Numerical Simulation

## Two-Phase Flow Phenomena

### Concern:

- Gas-Liquid Two-Phase Flow Phenomena in Rocket Engine System
- Sloshing in Liquid Rocket Tank
- Atomization
- Liquid Behavior on Steam Turbine Blade

### Approach:

- CFD Analysis
- Experiments in Sloshing Test Facility and Atomization Test Facility

## Internal Flow of Jet Engine System

### Concern:

- Effect of Body Surface Boundary Layer on Stability of SCRAM Jet Engine Flow
- Flow and Heat Transfer Characteristics of Surface Oil Cooler

### Approach:

- Experiments in M2.0 Tunnel and CFD Analysis

## Bio-fluid Mechanics

### Concern:

- Characteristics of Oscillatory Flow in Branched Tube, Avian Lung System, Respiration of Insect
- Enhancement of Mass and Heat Transport Micro Pump System (Impedance Pump)

### Approach:

- Flow Visualization, PIV, and Numerical Analysis