Research Topics

- Thermal Protection System
  - Materials
    - Carbon-Carbon, Carbon-Phenolic
    - Silicon Carbide, Silica Phenolic
    - Tungsten, Cork, etc
  - Methods of Study
    - Ablation Test with Arc Plasma
    - Computational Fluid Dynamics

- Space Shuttle Reentry
  - Hypersonic Region
    - High Mach Number (~25)
    - Aerodynamic Heating with Strong Shock
    - Rarefied Gas Environment

- High Speed Train Aerodynamics
  - Simulation on Pantograph System
    - Aerodynamic Performance & Noise
    - Panhead Shape Optimization
    - Great Train Express
    - Compression Wave Propagation
    - GTX System Initial Design

- Arc Plasma Analysis
  - Design of Arc Jet Wind Tunnel
    - Efficiency, Performance
    - Manufacturing of Arc Jet
    - Electric Propulsion System
      - Analysis of MHD Equation

- Rocket Nozzle Flow Simulation
  - Non-Equilibrium Flow
    - High Mach Number
    - High Temperature
  - Plume Analysis
    - Exhausted Gas at Rocket Nozzle
    - Pressure, Heat Flux Prediction

- Plasma Flow Control
  - Plasma-Fluid Analysis
    - Dielectric Barrier Discharge (DBD) Plasma
    - Stealth (RCS reduction)

- Meshless Method
  - Meshless Method for Compressible Flows
    - LSM with Geometric Conservation Law
  - Complex Flow Analysis
    - Complicated Geometry & Moving Object

About Lab

- Structural and Chicago Flow Analysis
  - Finite Element Method
    - Non-Linear Analysis
      - Stress, Plasticity
      - Fatigue Analysis

Members

- Members
  - Ph.D. Course: 14
  - Master Course: 7

- Current
  - Ph.D. Students: 10
  - Master Students: 3

- Alumni
  - Professors: 3
  - Researchers: 20

- Collaborations
  - Industry: Boeing, Airbus
  - Academia: MIT, Caltech

- Equipment
  - High-Pressure Wind Tunnel
  - High-Temperature Furnace
  - Computational Fluid Dynamics Simulators