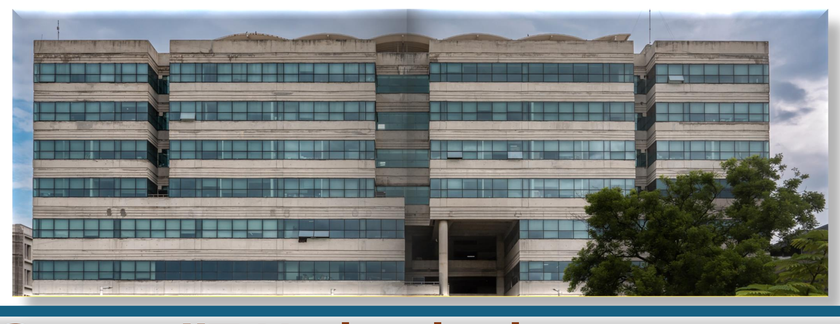
MAE-IC 2024

MAE-Industry Connect 2024



भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Computational Fluid Dynamics Group, IIT Hyderabad

Prof. Raja Banerjee
Professor

Areas of research:
- Spray Dynamics
- Turbulent Combustion
- Bulk Interfacial Flows

Prof. Venkata Subbaiah
Professor

Areas of research:
- Hypersonic Flows
- Cooling of Electronic Devices
- Computational Heat transfer

Dr. Nishanth Dongari
Associate Professor

Areas of research:
- Rarefied Gas Dynamics
- Molecular Dynamics
- Microfluidics

Dr. Harish Nagaraj Dixit
Associate Professor

Areas of research:
- Interfacial Fluid Mechanic
- Electrohydrodynamics
- Flow in Biological Systems

Dr. Lakshmana Dora Chandrala
Assistant Professor

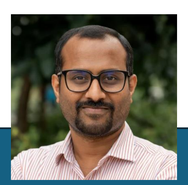
Areas of research:
- Supersonic Flows
- Multiphase Flows
- Blast Wave Dynamics

Dr. Niranjan Shrinivas Ghaisas
Assistant Professor

Areas of research:
- Wind Energy
- Turbulent Flows
- Multi-Material Simulation

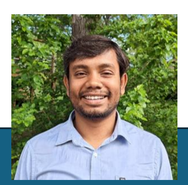
Dr. Sachidananda Behera
Assistant Professor

Areas of research:
- Turbulence Modelling
- Flow Control
- Two-Phase Flows



Dr. S K Karthick
Assistant Professor

Areas of research:
- Hypersonic Aerothermodynamics
- Fluidic/Energy Conversion Devices
- Jet Aeroacoustics



Dr. Ankush Kumar Jaiswal
Assistant Professor

Areas of research:
- Thermal Comfort
- Water Harvesting
- Multiphase Systems

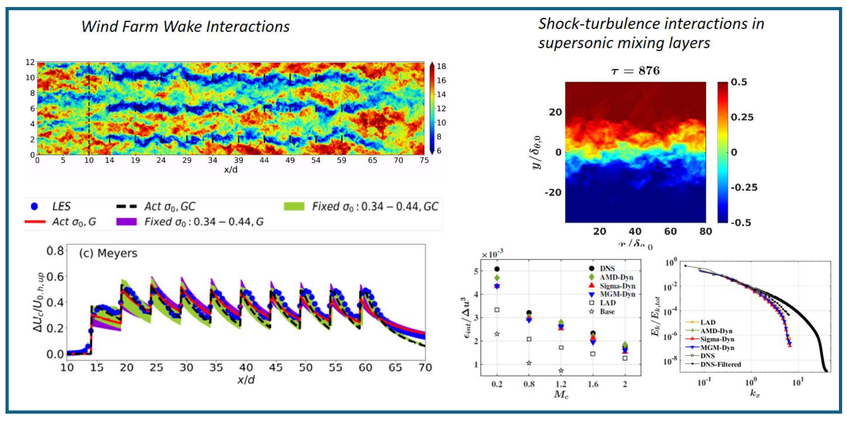
Projects

- Development and Application of a Multiscale Dual Grid Eulerian-Lagrangian Solver to Study Atomization of a Simplex Atomizer
- Development of a Compression Ignition Engine working on Ammonia/Natural Gas & Biodiesel Blends
- Development of an on-board spray controller model for UAVs using AI for precision agriculture
- Development of a Highly Scalable CPU-GPU Hybrid Architecture Based Parallel Two Phase Unstructured CFD Solver
- Boundary layer and wind farm flows over heterogeneous terrain: Design-oriented model development using large-eddy simulations
- Investigation of end-wall acoustic loading on a deep duct present ahead of a recirculation bubble for a wide range of Mach numbers
- Development of an unsteady wind tunnel for simulating flight-relevant flow conditions for a minor or nano UAV
- Stability of a three-dimensional vortex with radial density stratification
- On the role of inertia and surfactants in moving contact line flows
- Connecting operating variables, cone/jet features and mesh properties in electrospinning: using experiments and modelling to bridge theory and applications,
- Study of cavitation bubble induced vortex rings and bubble behaviour between curved boundaries
- Simulation of aero-optical effects

Cumulative Funding: 15.15 Crs

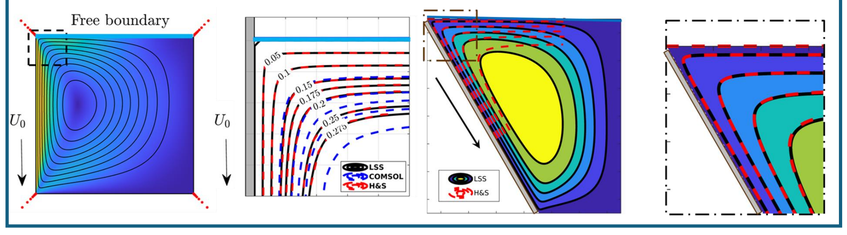
Research

Wind Farm Wake Interactions

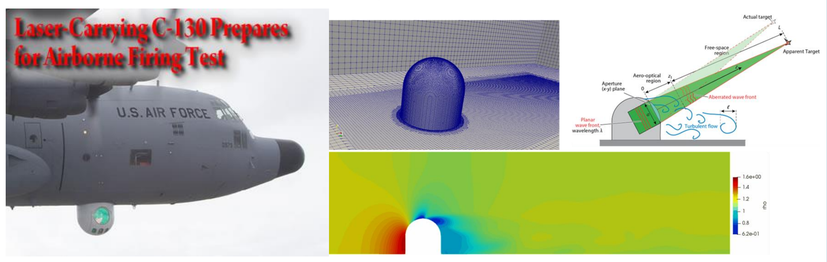


Shock-turbulence interactions in supersonic mixing layers

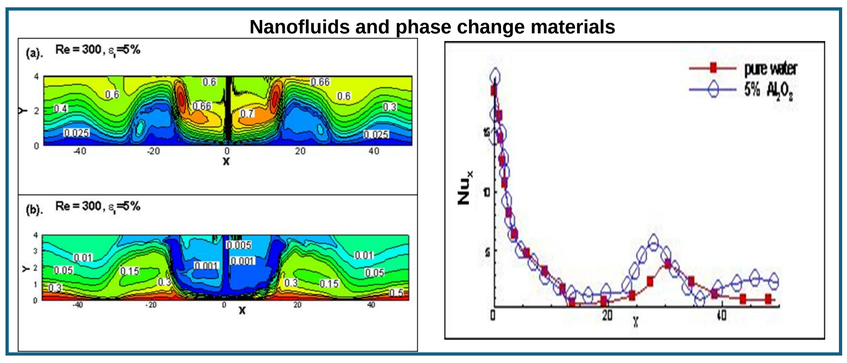
Simulation of moving contact line



Simulation of Aero-optical effects on laser turrets

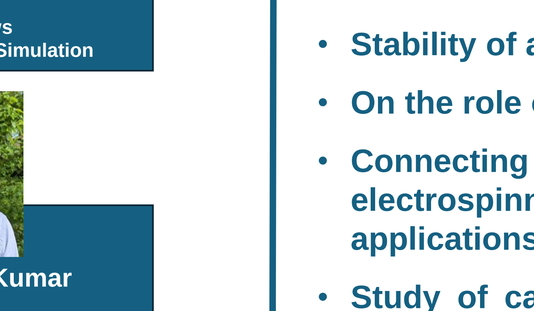


Nanofluids and phase change materials

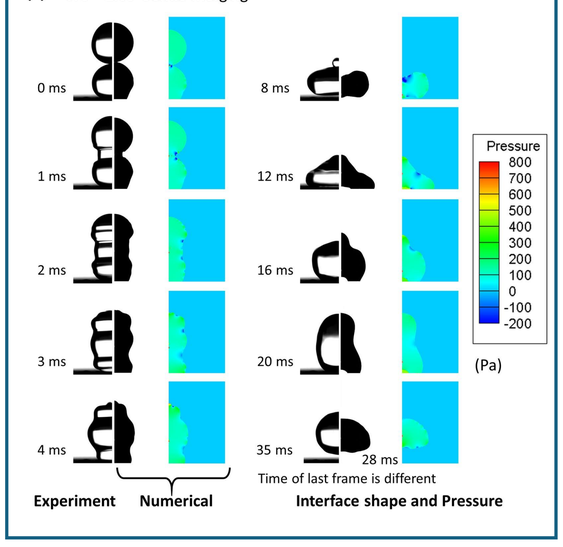


Numerical schlieren contours of shock-induced transient jet

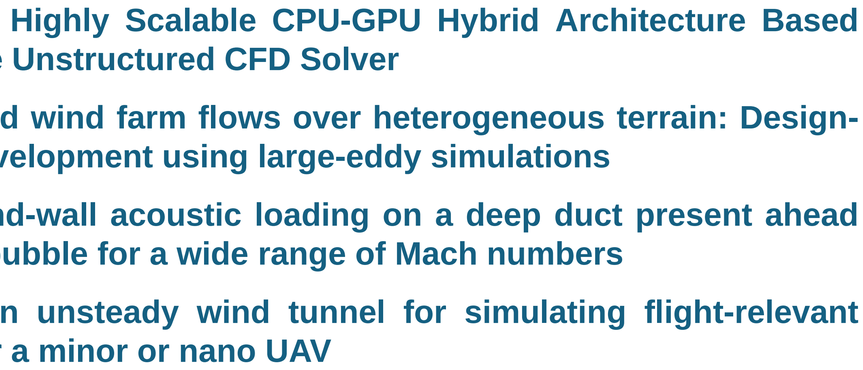
Electrospinning and electro-straying studies

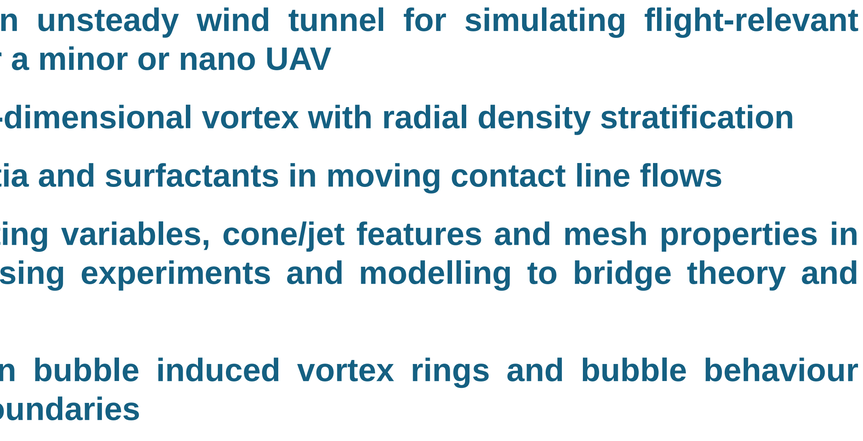


Drop on Drop Impact

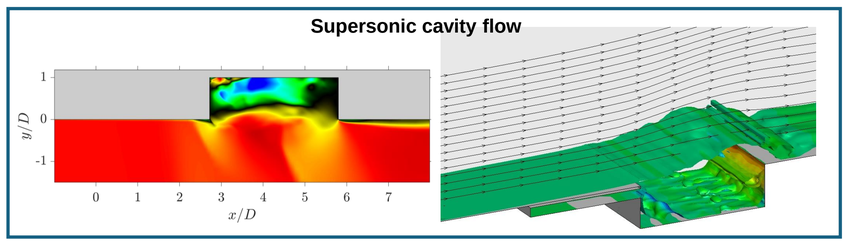


Supersonics Scramjet

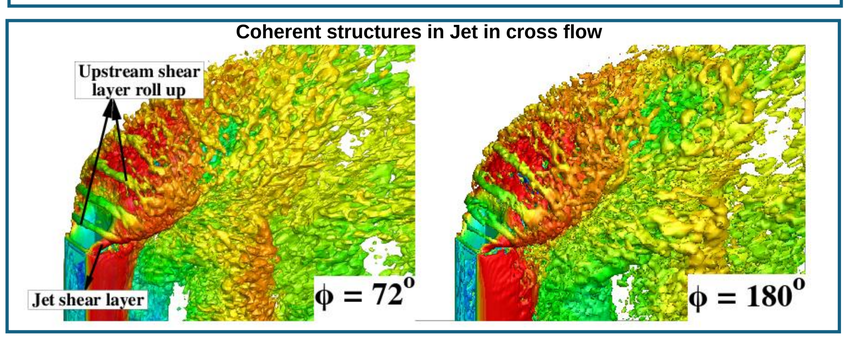




Supersonic cavity flow



Coherent structures in Jet in cross flow



Industrial Partners

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Sept 2024