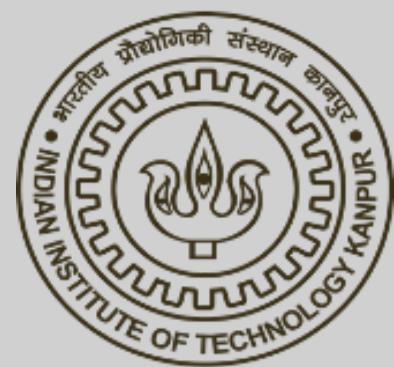


INDIAN INSTITUTE OF TECHNOLOGY, KANPUR



Department of Aerospace Engineering



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ABOUT US

Established in 1964, the department of Aerospace Engineering at IITK is one of the prominent centres for advanced flight research and development across the lengths and breadths of the country. Not only did the department contribute to the aerospace industry but has also endorsed projects to strengthen the air superiority of the nation. Moreover, the department is engaged in Engineering Science instruction, in-flight laboratory work, aerodynamic testing, indigenous design and fabrication of advanced facilities and instruments. The department specializes in Aerodynamics, Flight Mechanics, Propulsion and Aerospace Structures. The department houses one-of-a-kind Flight Lab with three single engine airplanes, a motored glider and a 1000 m runway. The National Wind Tunnel Facility is one the few facilities available for public and private enterprises to test and correlate their results. Various other academic institutions and research organizations in India also make use of the department facilities.



Message From HOD

The Aerospace Engineering Department is more than 40 years old. Till 1991, it was known as Aeronautical Engineering Department. The name change was accompanied by addition of topics relating to spacecraft in the UG curriculum; some members of the faculty had been conducting research and guiding PG students in this area even before the formal alteration of the name in 1991. In matters of teaching, research & development, the department has always tried to strike a balance between hardware development and experiments on one hand, and theory and computational aspects on the other. The faculty strength currently is 31. We share four faculty members with the Sustainable Energy Engineering Department, although their parent Department is Aerospace Engineering. The department has 274 UG Students (including Dual Degree Students), 124 M.Tech students, 25 MS(R) students and 111 Ph. D students.

Dr. Abhijith Kushari
Professor and Head
Department Of Aerospace Engineering
Indian Institute of Technology, Kanpur

Email: akushari[AT]iitk.ac.in

Office Phone: 0512-259-7126



ACADEMIC CURRICULUM

B. Tech

4 YEARS
Program

Students: 274

M. Tech

2 YEARS
Program

Students: 124

M.S(R)

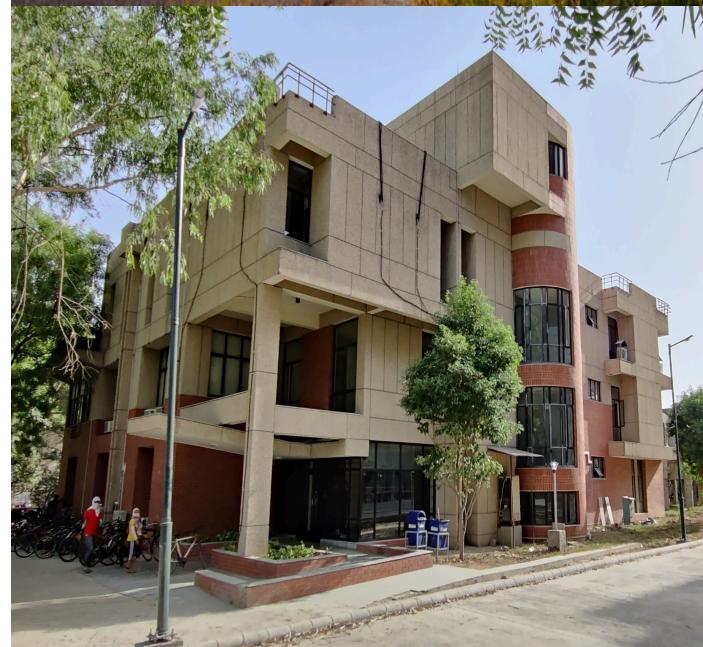
2+ YEARS
Program

Students: 25

PH.D

5 YEARS
Program

Students: 111



ACADEMIC COURSES

- Aerodynamics
- Aero-model Design & Fabrication
- Aerospace Propulsion
- Aircraft Design
- Aeroelasticity
- Analysis & Composite Structures
- Advance Computational Fluid Mechanics
- Air-breathing Missile Propulsion
- Aerospace Structural Analysis
- Acoustics in Fluids
- Applied Compressible Flows
- Boundary Layer Theory
- Boundary-Layer Instability & Transition
- Compressible Aerodynamics
- Computational Fluid Dynamics
- Continuum Hypersonic Aerodynamics
- Composite Materials
- Dynamics & Vibration
- Finite Element Method
- Flight Mechanics & Controls
- Fundamentals of Combustion
- Heat Transfer in Aerospace Applications
- Helicopter Theory
- High-Temperature Gas Dynamics
- Hypersonic Flows
- Intro to Virtual Instrumentation
- Introduction to Aerospace Structures
- Molecular Gas Dynamics
- Optimal Space Flight Control
- Rocket Propulsion
- Space Guidance Navigation & Control
- Space Dynamics
- Turbo Machinery
- Turbulence
- Unsteady Combustor Dynamics
- Unsteady Gas Dynamics
- Viscous Flows

Departmental Labs

UG Laboratories

- Low Speed Aerodynamics Laboratory
- High Speed Aerodynamics Laboratory
- Flight Laboratory
- Structures Laboratory
- Aero-modeling Laboratory
- Design Laboratory

Research Laboratories & National facilities

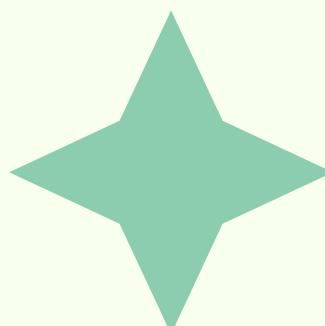
- Advanced Propulsion Lab
- Advanced Combustion and Acoustics Lab
- Autonomous Helicopter Facility
- Computational Fluid Dynamics Lab
- Unsteady Aerodynamics Lab
- Flame and Combustion Dynamics Lab
- High Performance Computing Lab
- Virtual Instrumentation Lab
- Structures, Structural Analysis Lab
- NWTF, ACECOST
- Computational Propulsion Lab
- Combustion Lab
- Fluid dynamics Lab
- Flight Lab
- Structures and Material Characterization Lab
- Unmanned and Micro-aerial Vehicle Lab



LOW SPEED AERODYNAMICS LAB

LAB INCHARGE: Dr. Kamal Poddar

A fully functional facility to conduct wind tunnel experiments for the aerodynamic, propulsive and aeroelastic characterization of fixed, flapping and rotary wing and micro aerial vehicles. The lab has the following wind tunnels to carry out experimental research in aerodynamics: Low turbulence tunnel, Boundary layer tunnel, Twin air or 5D tunnel, Water tunnel.



Research Areas

1. Unsteady Aerodynamics
2. High AoA Aerodynamics
3. Flow Control on airfoils, wings & other bodies
5. Bluff Body Flows
6. Wind Engineering
7. Decelerator Aerodynamics
8. Transition & turbulence
9. Vortex Dynamics
10. Granular Flows
- II. Dynamic Stall
12. Separation Control
13. Fluidic Oscillator



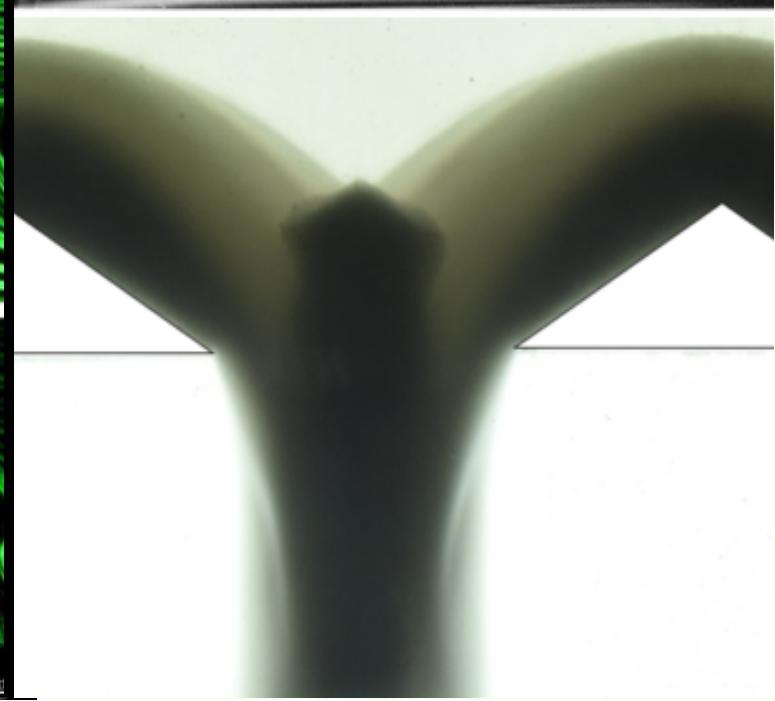
Flapping Wing UAV
steady Aerodynamics Lab
incharge: Dr. Debopam Das



Flow field of a rotationally oscillating cylinder at $Re \sim 150$
Courtesy: Dr. Sanjay Kumar and Dr. Kamal Poddar



Flow field of a rotating cylinder at $Re \sim 250$ in a soap film tunnel
Courtesy: Dr. Sanjay Kumar



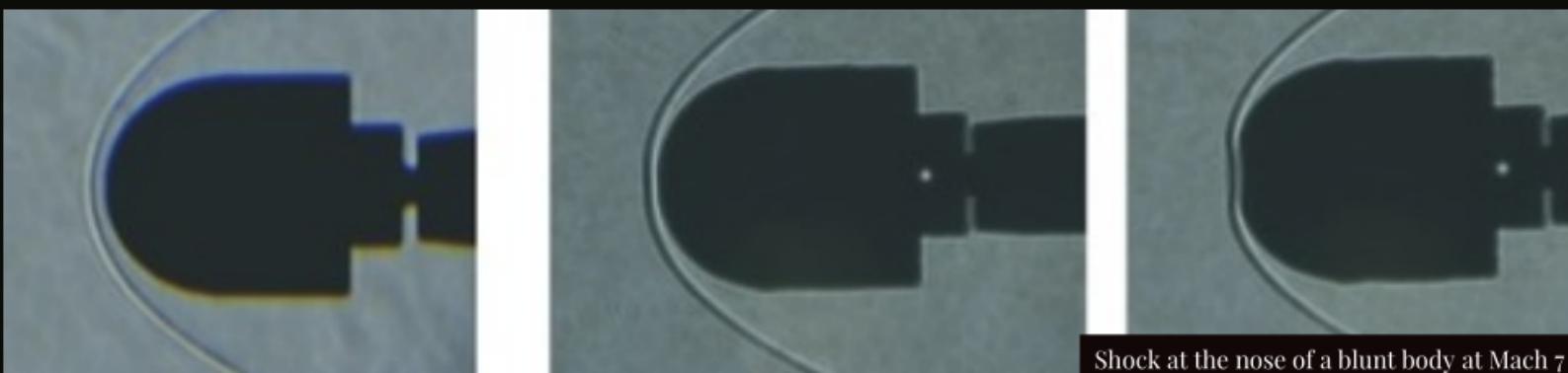
HIGH SPEED AERODYNAMICS LAB

LAB INCHARGE: Dr. Mohammed Ibrahim Sugarno

This lab of our department is well known for its research in the area of gas dynamics. The lab also houses an intermittent, blowdown type supersonic wind tunnel. The tunnel is equipped with a dedicated computer system for tunnel control and data acquisition. This facility has already made a substantial contribution in establishing new testing techniques and basic research in the area of transonic/supersonic flows.

RESEARCH AREAS

- Supersonic, Transonic & Subsonic Aerodynamics
- Gas Dynamics: experimental & theoretical investigation
- Rarefied Flows
- Applied Gas Dynamics & High-Speed Jets
- Sudden Expansion Problems



Shock at the nose of a blunt body at Mach 7

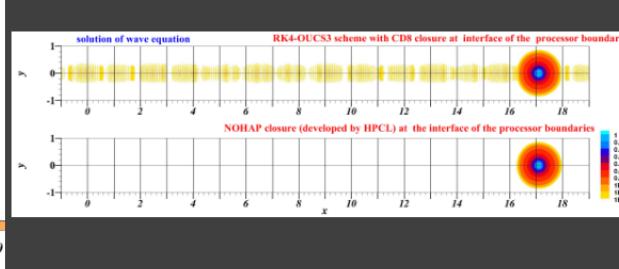
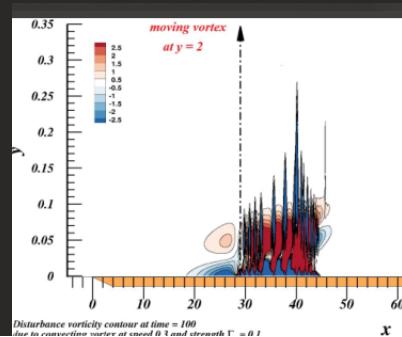
>>> HIGH PERFORMANCE COMPUTING LAB

RESEARCH AREAS

- High accuracy, scientific computing from the first principle.
- Theoretical analysis of precursor of instability and transition of fluid flows.
- Receptivity analysis and transition control by DNS and Implicit LES.
- Multiple Hopf bifurcations and proper orthogonal decomposition.
- Development of coherent structure detection methods.
- Global spectral analysis of numerical schemes.

LAB INCHARGE: Dr. R K Mathpal

The primary focus is on developing and implementing high fidelity computing methods for various flows, including subsonic, supersonic, and hypersonic. The emphasis of the research is on developing high accuracy computing methods to aid in bridging the gap between theoretical and computational fluid dynamics and heat transfer. The instability, transition to turbulence, and control of fluid flows are analyzed in theoretical and computational framework with the help of in-house developed tools.



AEROMODELLING LAB

Lab Incharge: Dr. Subrahmanyam Saderla

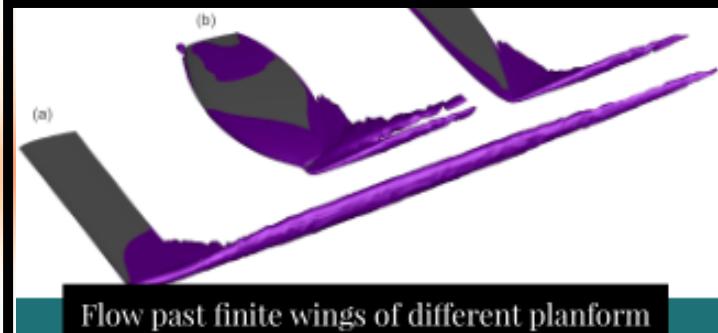
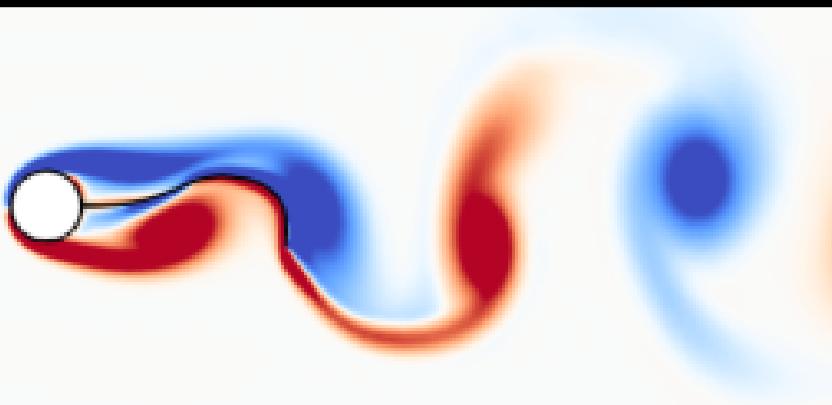
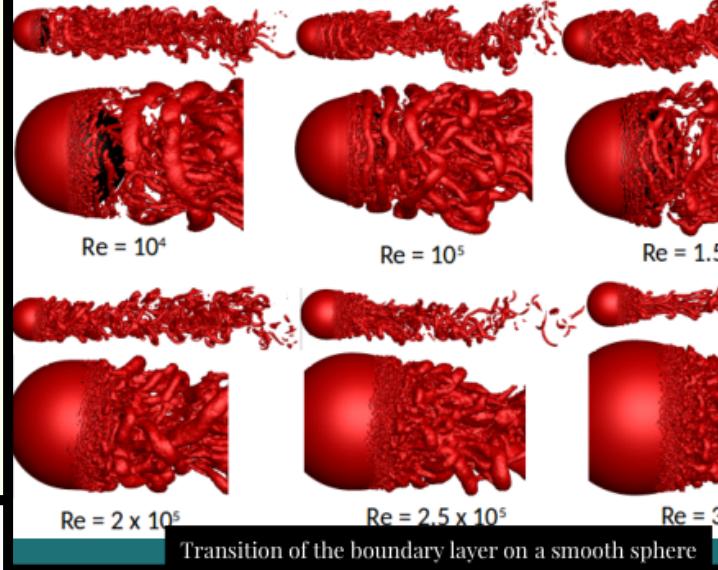
In the Aeromodelling Lab, students design, fabricate and fly models. It not only gives a primary introduction to the world of aerodynamics, designing, controls, electronics, engine technology, wood crafting and the technology of new materials but also provides a hands-on experience necessary for developing a practical aptitude.



COMPUTATIONAL FLUID DYNAMICS LAB

Lab Incharge: Dr. Sanjay Mittal

Computational Fluid Dynamics lab facilitates the study of basics of fluid flow, design of numerical methods, and their application to situations of practical interest. Scientific investigations mainly involve the fundamentals of flow phenomena. e.g. stability and turbulence.

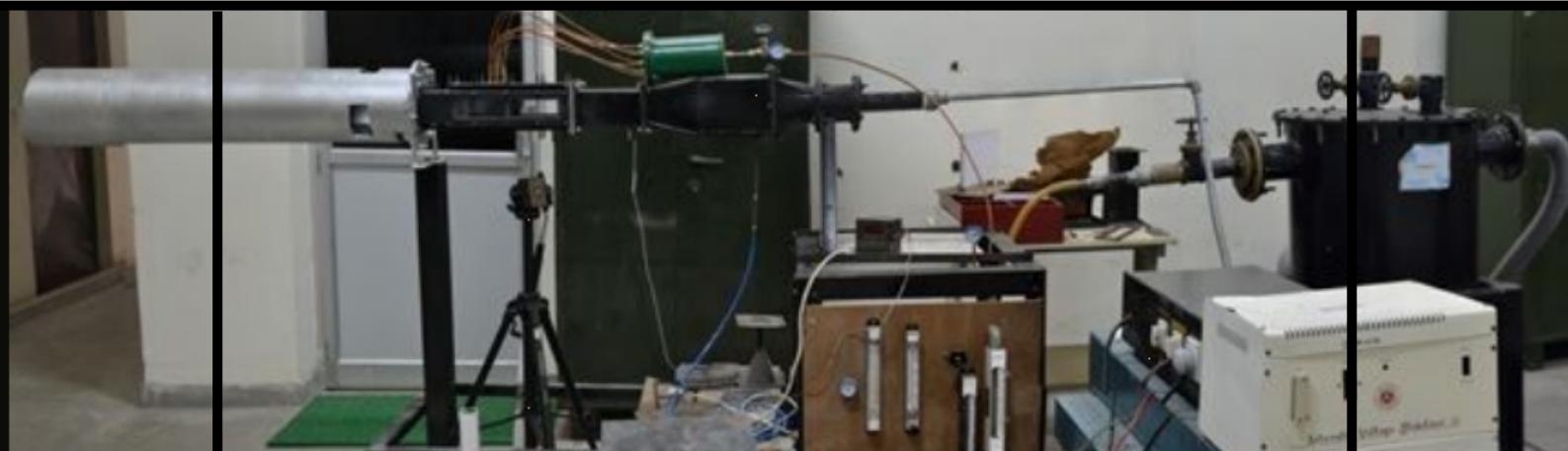


Flow past finite wings of different planform

ADVANCED PROPULSION LABORATORY

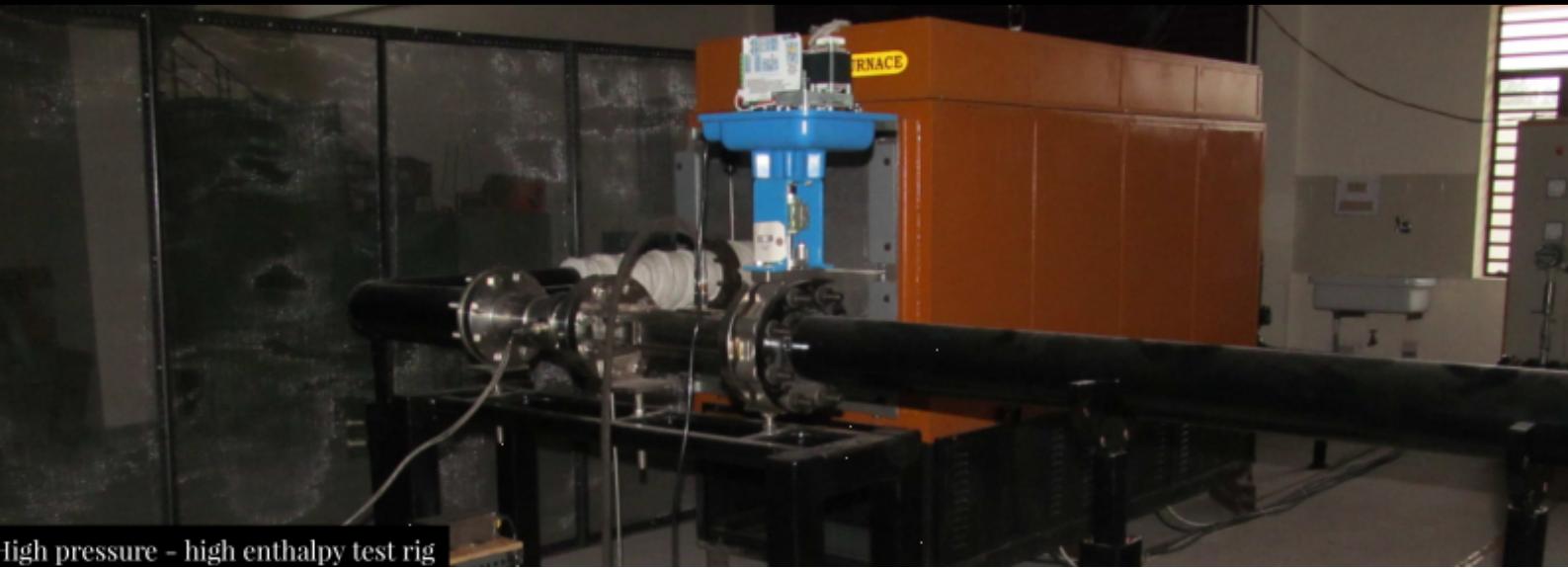
LAB INCHARGE: Dr. Abhijith Kushari

The lab is equipped with a continuous combustion unit where heat balance studies, exhaust gas composition, effect of fuel and flame stability test can be performed. Following are the facilities available in lab: low speed the cascade wind tunnel, 2-shaft gas turbine, continuous combustion unit, gaseous fuel combustion test rig, dump combustor with optical windows.



Research Areas

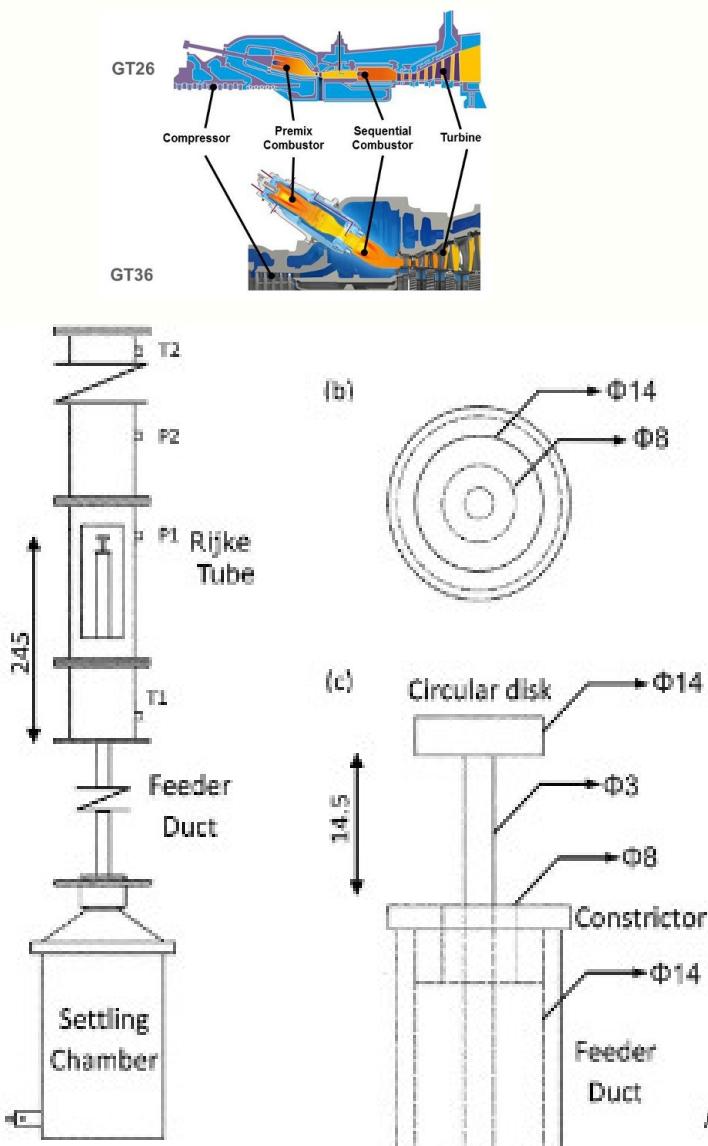
- Flow Diagnostics
- Internal Flow Control
(Active & Passive)
- Liquid Atomization &
Spray Combustion
- Thrust Vectoring
- Electric Propulsion
- Aeroelasticity
- Linear Cascade
Compressors



High pressure - high enthalpy test rig

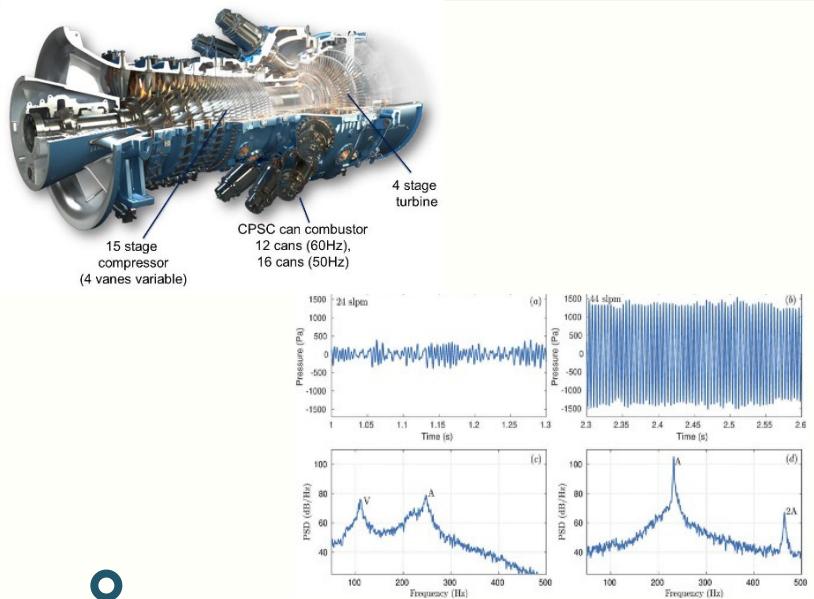
ABOUT

Perform investigations in in-house developed test rigs, which are instrumented with state of art measuring instruments. Experiments are performed in a wide variety of configurations, starting from a simple Bunsen type burner to a realistic gas turbine type annular combustor. Perform numerical investigations and validate experimental findings.



ADVANCED COMBUSTION AND ACOUSTICS LAB

Lab Incharge: Dr. Sathesh Mariappan & Vaibhav Arghode



RESEARCH AREAS

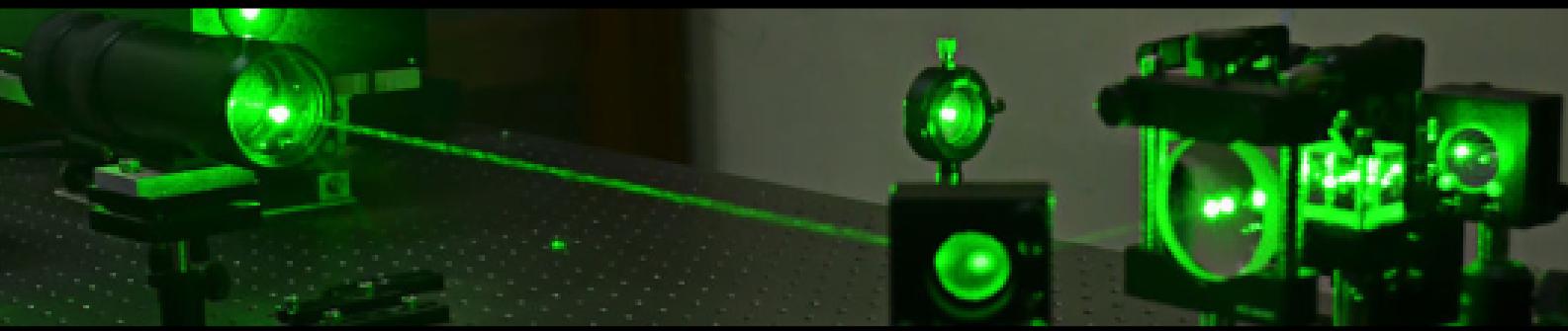
- Design clean and quiet combustors for fuel- lean. Conditions
- Reduce unwanted large-amplitude flow oscillations in Combustion Chamber
- Mitigating Combustion Instability
- Thermo-acoustics Interactions
- Colourless Diffusion combustion
- Alternative Fuel & Combustor Performance

STRUCTURES & MATERIAL CHARACTERIZATION LAB

Lab Incharge: **Dr. Rajesh Kittey**

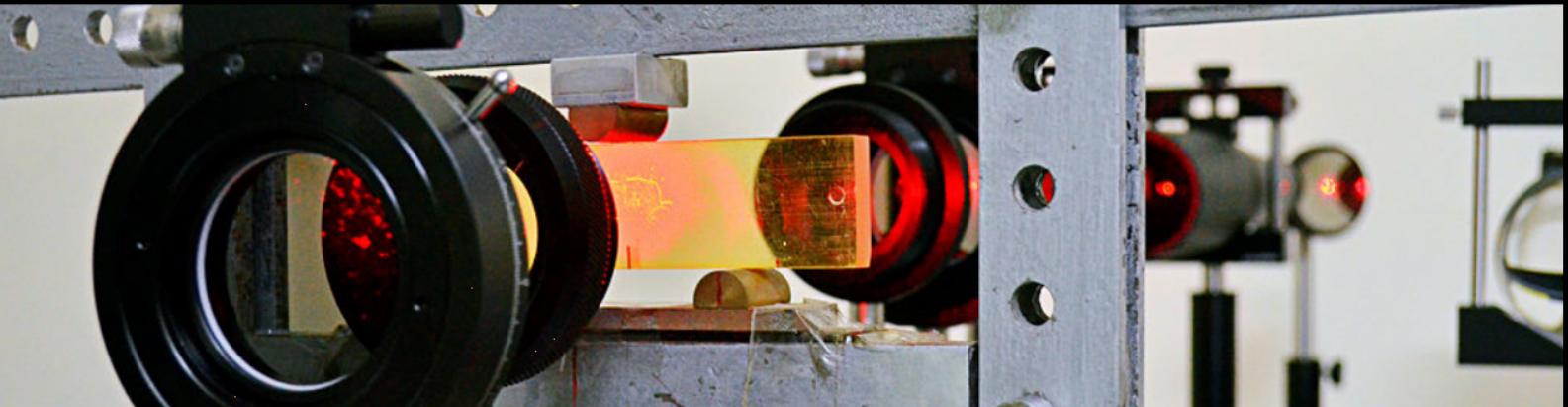


Over the last few years, we have been developing and testing smart structural system engineering structures with integrated sensor, information processing, feedback control and actuating devices. The smart structures experiments have been related to building Innovative smart sensors, vibration control and structural health monitoring concepts. Research efforts are directed towards focused on fabricating smart materials such as piezoelectric materials and hydro gels and damage diagnostic methods.

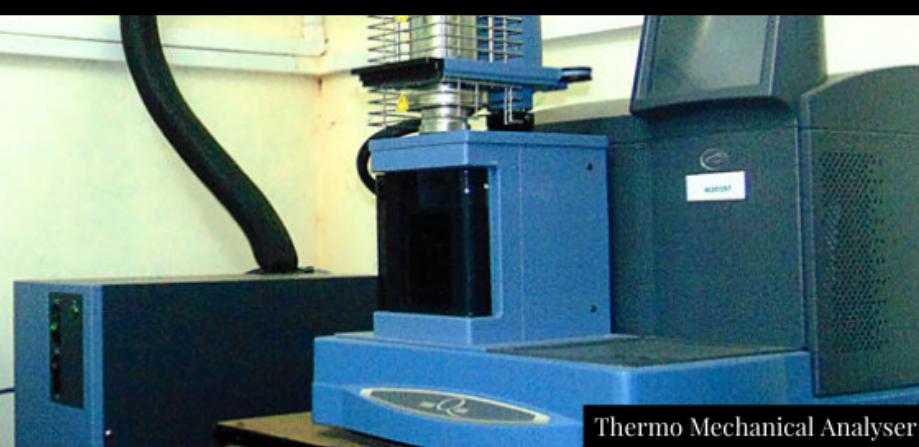


Research Areas

-
- Stochastic Analysis
 - Smart Structure Modeling & Analysis
 - Generalized Damage Mechanics
 - Composite Structure Analysis & Design



Differential Scanning Calorimeter



Thermo Mechanical Analyser

FLIGHT LAB

Lab Incharge: Dr. G. M. Kamath

The flight lab is a unique national facility with three single-engine aeroplanes: Cessna 206H, Hansa-3 and Piper Saratoga. The Flight Lab also has a Pipistrel Sinus 912 motored glider. The operations and maintenance of the Flight Lab are carried out in compliance with DGCA regulations. The Flight Lab conducts courses for students wherein they are taught various aspects of conducting experiments in flight and obtaining and analysing different aircraft flight parameters. The lab also provides an opportunity for faculty focusing on broad areas of aircraft structures, flight mechanics, aerodynamics and avionics to conduct experiments as part of their research.



Research Areas

- Parameter Estimation
- System Identification
- Guidance & Control of Aircraft & Unmanned Aerial Systems
- Aircraft Structural Health & Usage Monitoring



HELICOPTER AND VTOL LAB

Lab incharge: Dr. Abhishek

This focuses on the fundamentals of design, manufacturing and testing of systems. Also sub-systems for a mini-Helicopter are developed. Autonomous Mini-Helicopter which while weighing only a few kilogram incorporates most of the functions of a real life helicopter and achieve autonomous flight.



Research Areas

- Design & Development of avionics package:
 1. Ground Control
 2. Sensing & Actuation
 3. Communication Navigation
 4. Automatic Flight Control
- Flight testing of autonomous helicopter and expanding its utility by making the vehicle perform intelligent tasks.
- Structural design and development of a mini-helicopter



COMPUTATIONAL PROPULSION LAB

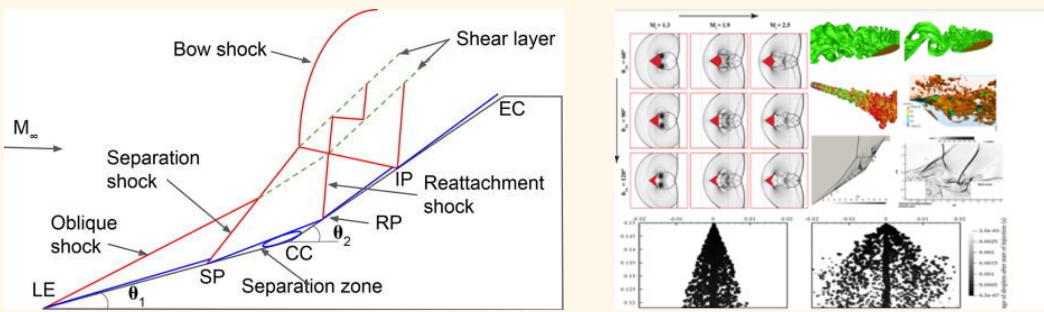
LAB INCHARGE: DR. ASHOKE DE

RESEARCH AREAS

- High-Speed Flows
- Flow-Acoustics Coupling
- Fluid-Structure Interaction
- Turbulence Modelling: DNS, LES, Hybrid RANS/LES
- Combustion & Multiphase modelling
- Flow Control

ABOUT:

The lab is primarily focused on computation-based research in the area of Fluid Dynamics and Combustion. We are involved in both development, and application of algorithms for fluid flow, heat and mass transfer. At CPL, we work on cutting-edge research using CFD and their application to multidisciplinary engineering problems starting from the Mesoscopic level to programs in Space, Energy, and Aero-elasticity. Applications include all regimes of steady-unsteady flows in combustion as well as in gas turbines, acoustics, turbulence modelling, supersonic flows, fluid-structure interaction, conjugate heat transfer and multidisciplinary fluid flow problems. We are involved in the simulation of the problems in areas of RANS, LES, hybrid RANS-LES, DNS, Lattice-Boltzmann, depending on its type and conditions.



STRUCTURAL ANALYSIS LAB

LAB IN CHARGE: Dr. Mohite

ABOUT:

The research domain comprises both fundamental and advanced problems that arise in the areas of research. Several high-end state-of-the-art computational codes have been developed in-house for multi-scale mechanics for damage; damage mechanics-based modelling of composite structures; modelling and analysis of piezo-material based structures; adaptive modelling of laminated plates; structural optimization and stochastic analysis of laminated structures.

RESEARCH AREAS

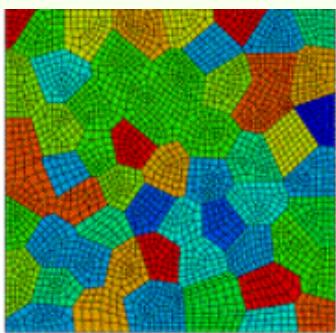
- Solid Mechanics
- Damage & Fracture Mechanics
- Adaptive FEM
- Structural Dynamics
- Stochastic Processes & Structural Optimization



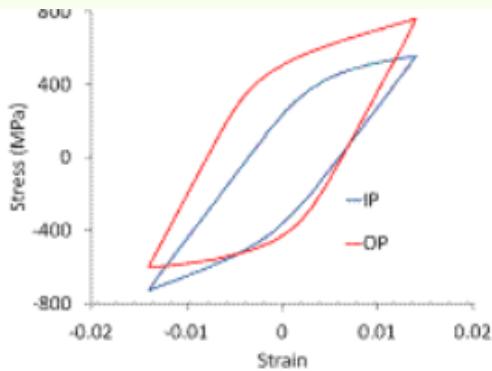
MULTISCALE MECHANICS AND SIMULATION LABORATORY

Lab Incharge: Dr. Pritam Chakraborty

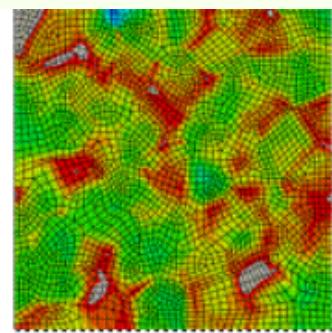
The aerospace industry strives for lean and durable design, requiring reduced maintenance and inspection. Our laboratory's focus is on the application of multiscalemodelling, micro mechanics,high-performance computing and digital image correlation techniques to enable these objectives. Applications include fatigue, creep, creep-fatigue, thermo-mechanical fatigue and corrosion fatigue modelling of aero-engine components. Sandwich and cellular structure design of launch vehicles, space shuttles, etc. for energy absorption and light-weight.



Microstructure

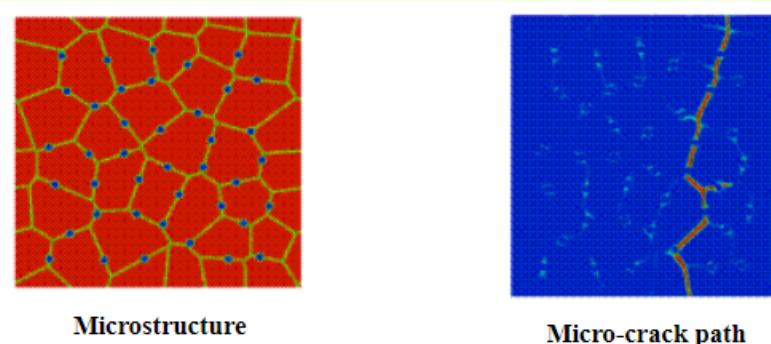
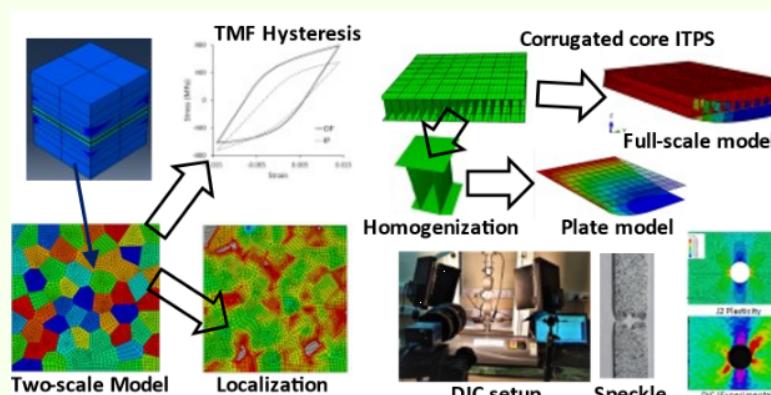


Hysteresis



Stress Distribution

Thermo-mechanical fatigue analysis at polycrystalline length-scale



Phase-field model of intergranular fracture

RESEARCH AREAS

- Solid mechanics
- Micromechanics and Homogenization
- Multi-scale Modeling (Time and Space)
- Inverse Modeling
- Finite Element Method (FEM)
- Computational and Numerical Method
- Fatigue and Fracture; Creep and Corrosion
- Plasticity, Crystal Plasticity and Damage Modeling

Sponsored Project List

- Experimental Investigation Of Azimuthal Combustion Instability (Screech) In Annular Combustors/Afterburners Of Gas Turbine Engines, Core Research Grant, Department Of Science And Technology.
- Sensitizing Fuel-Oxidizer-Diluent Mixtures For Detonation Cycle Engines, Aeronautical Research And Development Board (ARDB), India
- Investigation Of Combustion Characteristics Of Carbon Coated Aluminium Nanoparticles, STC (ISRO)
- Numerical Investigation Of Evaporating Spray In Cross Flow. Department Of Science And Technology Under National Super Computing Mission (NSM), India
- Design, Construction And Aerodynamic Testing Of Bio-Mimicking Flapping Wing Micro Air Vehicles And Models, Npmicav, DRDO & DST.
- Design And Development Of An Autonomous Mini Helicopter, Department Of Science & Technology
- Multi-Scale Damage Modelling, Testing And Analysis For Life Prediction Of Fibrous Composite Structures, AR&DB
- Tactical Reconnaissance Medium Altitude UAV, BEML
- Modelling And Simulation Of Debris Entry Trajectory With Aerothermal Break-Up (Indian Space Research Organisation)
- Establishment Of Hypervelocity Expansion Tunnel Test Facility And Heat Flux

Consulting Project List:

- Wind Tunnel Testing of two Chimneys (180 mtr & 225 mtr High) for 5x210 MW Unchahar WFGD
- VTOL UAV Design And Development for 7 kg Payload
- Wind Tunnel Testing for 2x700 MW Rajpura STPR Rajpura Punjab
- Wind Tunnel Testing for 150 mtr RCC Chimney for FGD package at Vallur TPS (3x500mw) Tamil Nadu
- Wind Tunnel Testing For 150 mtr RCC Chimney for FGD package at Talcher TPS Stage I & II (2x250 MW + 4x500 MW) Odisha
- Wind Tunnel Study of 150 mtr High RC Chimney for DVC Bokaro FGD Project
- Wind Tunnel Testing for 125 mtr High FGD Chimneys for 5x830mw CGPL Mundra TPS



Department of
Science &
Technology,
Government of
India



PH. D THESIS

- A study of Gas-Surface Interactions using Particle based Methods for Rarefied Gas Flows
- Multiscale Thermal Response Analysis of Ablative Materials using Molecular Dynamics and Finite Element Approach
- Aeroacoustic Investigation of Cavity Flows and Impinging Jets
- Computational Modeling of Dusty-Gas Flows for Planetary Landing Application
- Numerical and Experimental Investigation of High Efficiency Rotor Concepts
- A Micromechanical Study of Unidirectional Fibre Composites with Emphasis on Randomness in Spatial Distribution, Boundary and Interface Effects
- Linear instability of transient flows: Numerical approach and experimental validation

NOTABLE ACHIEVEMENTS

A small helicopter Unmanned Aerial System designed by Mendu Rama Krishna (PhD) and Mr Chirag Jain (MSR) from VTOL and Helicopter Laboratory, guided by Dr Mangal Kothari and Dr Abhishek, have won first prize in stage 3 of 2021 First Responder Endurance Challenge organized by National Institute of Standards and Technology (NIST), USA. The National Institute of Standards and Technology is a physical sciences laboratory and a non-regulatory agency of the United States Department of Commerce. Its mission is to promote innovation and industrial competitiveness. So far they have won \$40,000 in this competition.

PATENTS

- A Peripheral Vortex Reverse Flow Combustor with Coaxial Fuel Injection (PVRF- COAX) And Method Thereof
- Real-time Spherical Omnidirectional Visual Gyroscope

SAE

The Society of Aerospace Engineers (SAE) is the official body of the department of aerospace engineering IITK.

It is a community of students, faculty and staff members which primarily aims at increasing the level of interaction among the members.

Academic activities like organising industrial trips, workshops and seminars are an integral part of the society's functioning. Apart from these we also organise the department freshers' and farewell ceremony, movie sessions, department magazines, and summer camps.



PAST EVENTS

- Career talks with NASA scientist, SRIRAM RALLABHANDI, currently working in NASA Langley Research Center. (15 January 2022).
- MATLAB workshop for beginners to familiarize the student community with MATLAB and its applications. (30 January 2022).
- Organised departmental convocation where students were awarded their degrees and mementoes with chief guest Capt Sandeep Dinkar Sabnis, Director, NIAT.

PAN INDIA COMETITIONS

- Mathworks minidrone competition ,India 2022,co-hosted with Society of Aerospace Engineers and ICT Academy at IIT KANPUR.

SAE

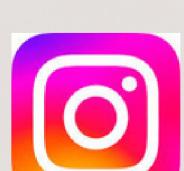


<https://sites.google.com/view/saeiitk/events?authuser=0>

SOCIETY OF AEROSPACE ENGINEERS
IIT KANPUR



<https://www.facebook.com/IITKSAE/>



<https://www.instagram.com/sae.iitk/>

DISTINGUISHED ALUMNI

Some Prominent Alumni

NAME	BATCH	ORGANISATION	DESIGNATION
N G R Iyengar	1971	Jain University, Bangalore	Pro Vice Chancellor, Director, IIAEM
Tonse Gokuldas Pai	1972	IIT Kanpur	Former Visiting Professor.
Ajay Kumar	1974	NASA Langley Research Centre	Distinguished Research Associate
S Narayanan	1975	IIT Madras	Professor
Dayanand Yadav	1977	IIT Kanpur	Professor

Ex-M.tech students

NAME	BATCH	ORGANISATION	DESIGNATION
Kunwar Pal Singh	1973	ADA	Group Director (ARD)
Vinay Prakash Mathur	1976	HAL	General Manager
Suresh Menon	1978	HAL	Deputy General Manager
Sudhir Kamle	1979	IIT KANPUR	Professor
K Chandrashekara	1979	University of Missouri	Professor
Satish Kumar	1982	DRDL	Director-Hypersonic Test vehicle
T Jayachandran	1983	VSSC, Trivandram	Head
Narendra Kumar Arya	1990	DRDO	Scientific Adviser to Chief of the Air Staff

Ex-B.tech students

NAME	BATCH	ORGANISATION	DESIGNATION
Amar Chand Garg	1966	Boeing	Senior Engineer
Satendra Singh	1968	Civil Aviation Department	Director General
Rajiv Shivpuri	1972	The Ohio State University	Professor
Sidh Nath Singh	1975	IIT Delhi.	Professor
Suresh Menon	1976	Georgia Institute of Technology	Professor
Adalat Ali	1979	DRDO	Project Director
Anil Enoch Deane	1979	University of Maryland	Professor
Vedula Muralidhar Murti	1979	University of Wisconsin-Milwaukee	Professor
Subroto Kumar Banerjee	1980	Air India	Deputy General Manager -Engg.
Rajiv Singh Chowdhry	1983	Lockheed Martin Skunk Works	
Alok Kumar	1987	Planning Commission, India	Deputy Director General
Rajat Mittal	1989	The George Washington University	Professor

ENTREPRENEURSHIP

IITK has its own incubation Centre for budding entrepreneurs Several Aerospace motivated ventures started:

- Whirly Bird
- Aurora
- Rotaviolabs
- Autobirdz
- Transoft

Aerospace Faculty Profile



Abhijith Kushari

Professor and Head

Email: akushari@iitk.ac.in, Ph: +91-512-259726(O) / 8536(R)

Website: <https://home.iitk.ac.in/~akushari/>

Area of Research: Rocket and Gas Turbine Propulsion, Instrumentation in Combustion and Fluid Mechanics, Liquid Atomization and Liquid Combustion, High Speed Flows



Ashoke De, Professor

Email: ashoke@iitk.ac.in, Ph: +91-512-259-7863(O) / 8301 (R)

Website: <https://home.iitk.ac.in/~ashoke>

Area of Interests: CFD, High Speed Flows, Flow-Acoustics Coupling, Fluid-Structure Interaction, Turbulence Modelling, Multiphase flows and Combustion, Energy Harvesting



D.P. Mishra, Professor

Email: mishra@iitk.ac.in, Ph: +91-512-2597125 (O) / 8695 (R)

Website: <https://www.iitk.ac.in/aero/dpm/index.htm>

Area of Interest: Combustion, CFD of Chemically Reacting Flows, Propulsion, Heat Transfer



Ajay Vikram Singh, Assistant Professor

Email: ajayvs@iitk.ac.in, Ph: +91-512-2592006 (O)

Website: <https://www.ajayvs.aero.com/>

Area of Interest: Combustion and Reacting Flows, Combustion Generated Functional Nanoparticles, Soot Formation and Oxidation, Detonations, Boundary Layer Combustion, Gas Turbine Combustion, Fire Dynamics, Flame Spread, Material Flammability, Renewable Energy Conversion



Rajesh Ranjan, Assistant Professor

Email: rajeshr@iitk.ac.in, Ph: +91-512-259-2203 (O)

Website: <https://sites.google.com/view/rajeshranjan>

Area of Interest: Turbomachinery Flows, Applied Aerodynamics, Stability & Flow Control, Transition and Re-laminarization, High Performance Computing



Sathesh Mariappan, Associate Professor

Email: sathesh@iitk.ac.in Ph: +91-512-259-6331 (O)

Website: <https://sites.google.com/view/sathesh-mariappan>

Area of Interest: Fundamentals of thermoacoustic interactions, Application of dynamical systems' theory to Thermo-fluid systems, Optical flow diagnostics, Acoustic measurements



Vaibhav Arghode, Assistant Professor

Email: varghode@iitk.ac.in Ph: +91-512-259-6294 (O)

Website: <https://sites.google.com/view/varghode>

Area of Interest: Combustion, Heat Transfer, Fluid Mechanics, Experimental Methods, Computational Fluid Dynamics



Navrose, Assistant Professor

Email: navrose@iitk.ac.in Ph: +91-0512-259-2022 (Office – 1st Floor, Helicopter Building)

Area of Interest: Fluid Mechanics, Aerodynamics, Fluid-Structure Interaction, Optimization, Computational Fluid Dynamics.

Aerospace Faculty Profile



Alakesh Chandra Mandal, Associate Professor

Email: alakeshm@iitk.ac.in, Ph: +91-512-259-7062 (O)

Area of Interest: Experimental aerodynamics, Flow instability and transition, Turbulent shear flows



Arnab Samanta, Associate Professor.

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Website: <https://sites.google.com/view/fpcal>

Area of Interest: Fluid mechanics, aeroacoustics, hydrodynamic stability, wave mechanics, flow control



Debopam Das, Professor

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Area of Interest: Theoretical and Experimental Fluid Dynamics, Aeroacoustics, Instability & transition, Vortex Dynamics. Unsteady Aerodynamics, Bird's and Insect's Flight



Kamal Poddar, Professor

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Area of Interest: Aerodynamics, Turbulence, Low and High Speed Flows



Arun Kumar Perumal, Assistant Professor

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Area of Interest: Experimental aerodynamics, High speed flows, Subsonic and supersonic jets, Jets in cross flow, Impinging jets, Drag reduction on automotive vehicles.



Mohammed Ibrahim Sugarno, Assistant Professor

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Area of Interest: Experimental Hypersonic Aerothermodynamics, High Enthalpy Test Facilities, Shock Waves



Rakesh Kumar, Associate Professor

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Area of Interest: Hypersonics, Rarefied Gas Dynamics, Microfluidics, Molecular Dynamics, Heat Transfer & Thermal Design



Sanjay Mittal, Professor

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Area of Interest: Aerodynamics, CFD, FEM



Sanjay Kumar, Professor

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Area of Interest: Fluid Mechanics - bluff body wakes, shock-accelerated flows, shock waves, shock tubes



K. Ghosh, Professor & Former Head

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Area of Interest: Flight Mechanics, Parameter Estimation from flight images, Neural modelling Design of Air Borne stores: Aircraft Bombs, Artillery shells and Rockets Design of Control law of guided missiles

Aerospace Faculty Profile



Ashish Tewari, Professor

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Area of Interest: Flight Mechanics, Control, Aeroservoelasticity, Unsteady Aerodynamics, Space Dynamics



Dipak Kumar Giri, Assistant Professor,

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Area of Interest: Linear and nonlinear controls for aerospace systems (flight vehicle), Satellite Attitude Dynamics and Control.



Mangal Kothari, Associate Professor

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Area of Interest: Optimal Control, Nonlinear and Adaptive Control, Flight Vehicle Guidance and Control, State Estimation, Motion Planning and Cooperative Control



Raghavendra P. Kukillaya, Assistant Professor

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Area of Interest: Aircraft and Airship dynamics and control, Systems modelling, simulation and design, Optimal control, Biomechanics



Subrahmanyam Saderla, Assistant Professor

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Area of Interest: Real time system identification of unmanned aerial vehicles, UAV Design, flight tests and parameter estimation, high angle of attack aerodynamic modelling, dynamic wind tunnel testing, experimental flight dynamics, chaotic modelling (of cancer cell growth, seismic data & material properties etc.) using Artificial Neural Networks.



Abhishek, Associate Professor

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Website: <https://home.iitk.ac.in/~abhish/>

Area of Interest: Rotary Wing Aeromechanics, Hover Capable Unmanned Air Vehicles (UAV), System Identification, Inverse Flight Dynamics Simulation for Helicopters, VTOL, Helicopter Design



P. M. Mohite, Professor

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Website: <https://home.iitk.ac.in/~mohite>

Area of Interest: Damage Mechanics of Laminated Composites, Composites, Finite Element Analysis



Rajesh Kitey, Professor

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Website: <https://home.iitk.ac.in/~kitey>

Area of Interest: Solid Mechanics, Fracture Mechanics, Experimental Stress Analysis, Optical Metrology, Mechanics of Thin Films, Composite Materials, Finite Element and Boundary Element Methods



Pritam Chakraborty, Assistant Professor

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Area of Interest: Mesoscale mechanics for plasticity, fatigue, creep and fracture; FEM; Multi-scale methods



Tanmoy Mukhopadhyay, Assistant Professor

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Website: <https://www.tmukhopadhyay.com/>

Area of Interest: Mechanical metamaterials, Advanced composites, Deployable materials and structures, 2D materials and heterostructures, Multi-scale mechanics (nano to macro), Stochastic analysis, Uncertainty quantification and reliability analysis, Surrogate modelling, Machine learning, Artificial intelligence.

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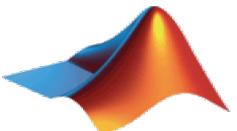
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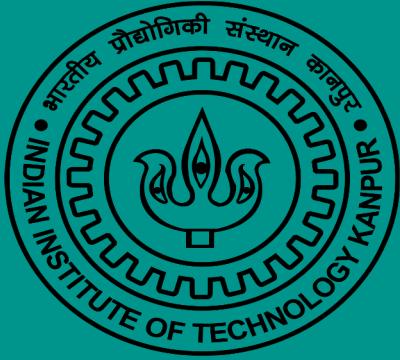


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