



# Mechanical Engineering @ BIT Mesra

Research, academics, and scope for collaborations



# About the Department

---

- Since its inception in 1955, the Department of Mechanical Engineering has a wide reputation for the quality of teaching and research it offers. It has been awarded top grades for both teaching and research activities from independent and government bodies. The excellent laboratory facilities, modern computer clusters, systematically designed curriculum, and dedicated faculty members make this department a dynamic place to study.
- Mechanical Engineering Graduates from BIT Mesra are placed by many prestigious companies. There is also an excellent career center on campus, which helps the students to get entry into multinational companies and research sectors.



# Some distinguished Alumni from department

---



**Mr. R. K. Gupta**

Founder & Chairman,  
Laxmi Publications Group  
& President Emeritus



**Prof. Ramesh Singh**

Faculty, Mechanical  
Engineering Department,  
IIT, Bombay



**Mr. Arup Roy Choudhury**

The Chief Commissioner, Right to  
Public Service Commission, West  
Bengal, Previously CMD of NTPC Ltd.



**Mr. T. Venkatesh**

An Indian administrative  
Service Officer,  
Members of Board of  
Directors of NTPC Ltd.



**Mr. Sudhir Mohan Trehan**

**Gold Medalist,**  
Executive Chairman of Avantha  
Power & Infrastructure Limited, and  
Vice Chairman of Crompton  
Greaves Ltd



**Mr. Pawan Bhageria**

Gold Medalist, Currently part of  
GM International Operations as  
Director, Ex Head of IT for Tata  
Motors Ltd.



# Some distinguished Alumni from department

---



**Mr. Amitava Bakshi**  
Chief Procurement  
Officer, Tata Steel Ltd.



**Mr. Ashish Anupam**  
Managing Director, Tata  
Steel Long Products Ltd.



**Mr. M. M. Singh**  
Chief Operating Officer,  
Maruti Suzuki India Ltd.



**Mr. Karan Bajaj**  
CEO/Founder,  
WhiteHat Jr



**Mr. Dilip Kunar**  
General Manager/  
Executive Manager  
Thiess Minecs India  
Pvt. Ltd.



**Mr. Sunil Jain**  
CEO & ED  
Hero Future Energies



**Mr. Avinash P. Gandhi**  
Former Special Advisor to  
Asia Automotive  
Acquisition Corp.



**Mr. Kushagra Sharan**  
Project Manager, IMS  
Learning

# Vision

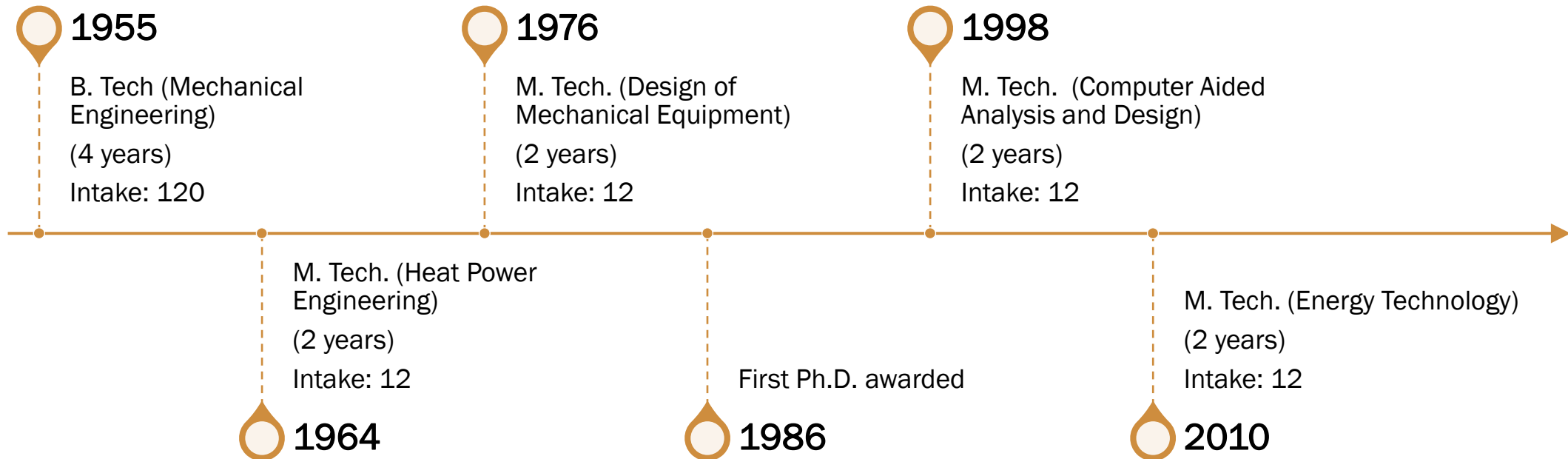
The Mechanical Engineering Department of Birla Institute of Technology, Mesra, Ranchi strives to be globally recognized for quality engineering education and research leading to well qualified engineers, academicians and researchers who are innovative, entrepreneurial and successful in achieving excellence in their field of study.

# Mission

1. To impart quality education to the students and enhancing their knowledge and skills to be globally competitive Mechanical Engineers.
2. To maintain state of the art research facilities to provide its students and faculty to create, interpret, apply and disseminate knowledge with an understanding of the limitations.
3. To develop linkages and interaction with industry, R & D organisation and educational institution for excellence in consultancy practices, research and teaching.
4. To provide conducive environment for learning, creativity and problem-solving skill.

# Brief History

---



# Programmes

---

## Under Graduate Programmes: (4 Years)

- B.TECH in Mechanical Engineering

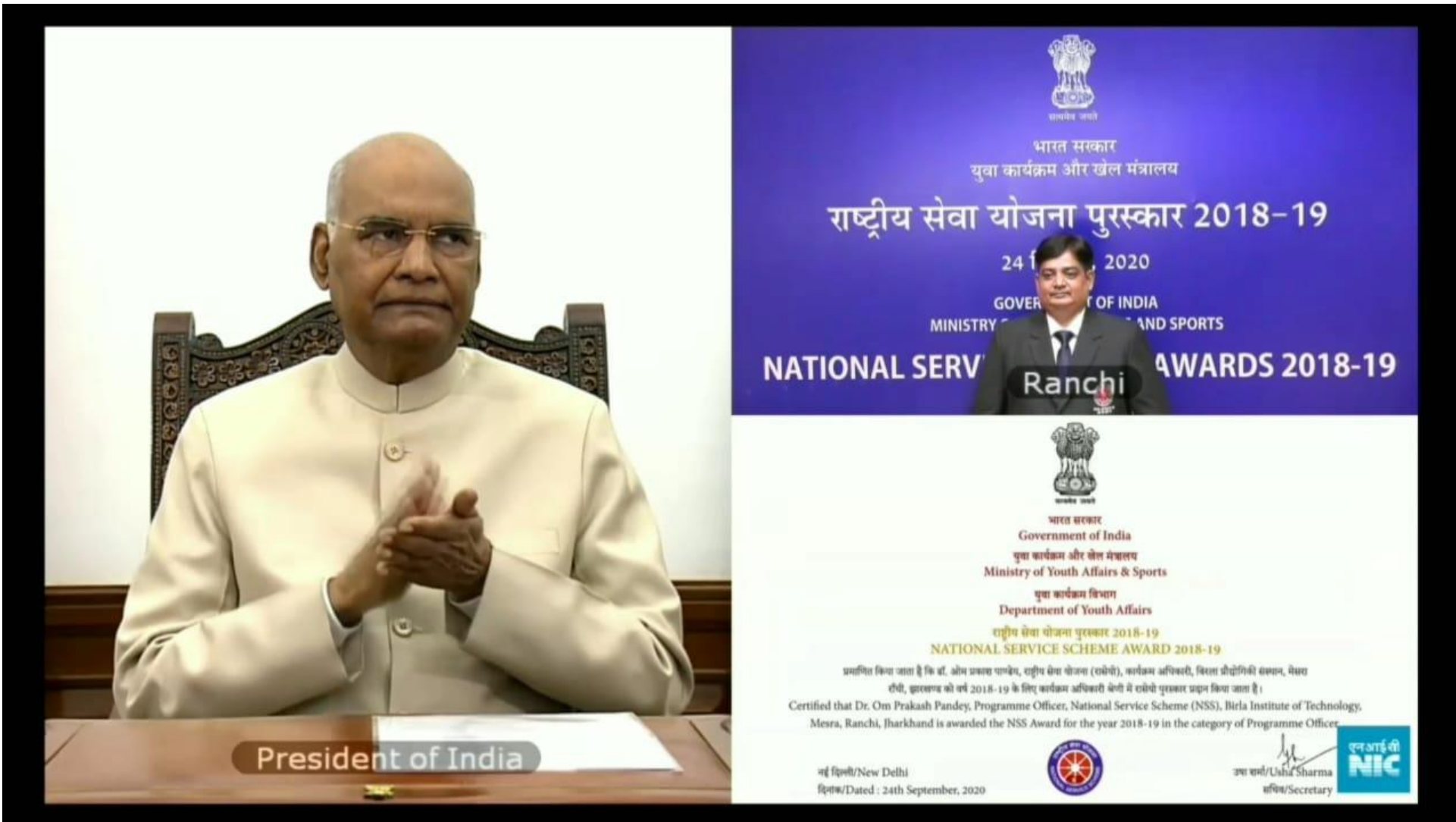
## Post Graduate Programmes: (2 Years)

- M.Tech. in Heat Power Engineering
- M.Tech. in Design of Mechanical Equipments
- M.Tech. in Computer Aided Analysis and Design
- M.Tech. in Energy Technology

## Doctoral Programmes:

- Ph.D. degrees are offered by the Department in Mechanical Engineering related disciplines as well as multi-disciplinary fields.
  - First degree awarded in 1986
  - Total intake (MO19-MO21): 27; Degree awarded in last 3 years: 10.

# Awards

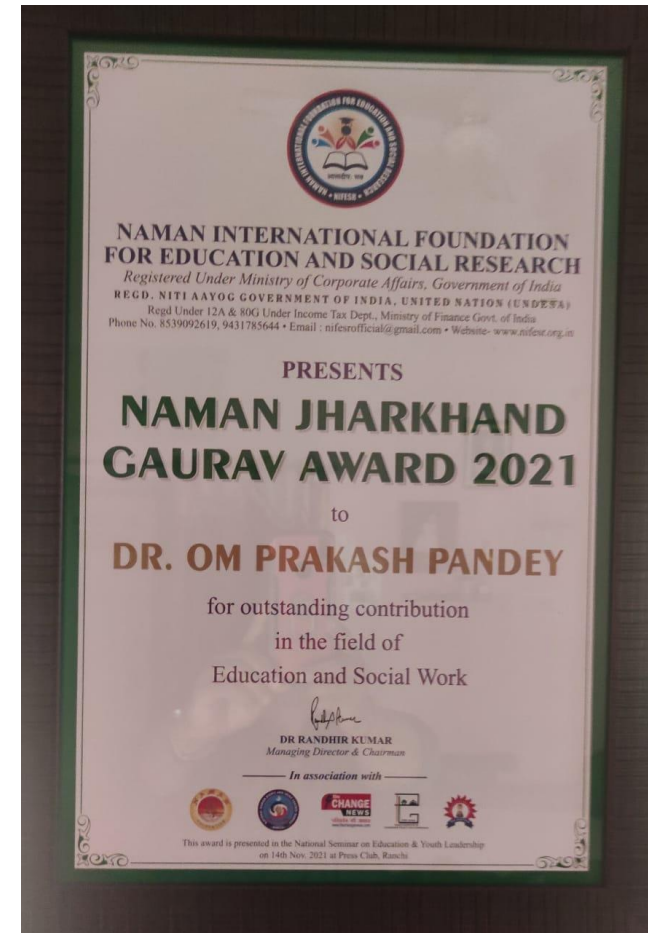




# Awards



Receiving Award from cabinet minister, Government of Jharkhand



# Awards

---



# Faculties

---



Dr. Dipti Prasad Mishra  
Professor and Head  
Ph.D. (IIT Kharagpur)  
Thermodynamics  
Convective Heat & Mass Transfer  
Classical & Statistical  
Thermodynamics



Dr. R. P. Sharma  
Professor  
Ph.D. (BIT Mesra)  
Design of Thermal systems  
Design and analysis of Heat Exchangers  
Computational Heat Transfer  
CAD



Dr. Kaushik Kumar  
Associate Professor  
Ph.D. (Jadavpur University)  
Composite Materials, Optimization  
Techniques, Basics of Mechanical  
Engineering



Dr. Apurba Kumar Roy  
Associate Professor  
Ph.D. (IIT Kharagpur)  
Basics of Mechanical  
Engineering, Advanced  
Turbomachinery



Dr. Rajeev Kumar  
Associate Professor and Co-  
Ordinator of Unnat Bharat  
Abhiyan  
Ph.D. (BIT Mesra)  
IC Engines  
Basics of Mechanical Engineering



# Faculties

---



Dr. Lakhbir Singh Brar  
Assistant Professor  
Ph.D. (BIT Mesra)  
Thermo fluids engineering  
Finite Element Analysis  
CFD



Dr. Sushil Kumar Dhiman  
Assistant Professor  
Ph.D. (BIT Mesra)  
Energy Conversion System  
Conduction and Radiation Heat  
transfer



Dr. Sujeet Kumar Mishra  
Assistant Professor  
Ph.D. (BIT Mesra)  
Machine Design  
Theory of Elasticity  
Advanced Computer Aided Design



Dr. Praveen Mishra  
Assistant Professor  
Ph.D. (BIT Mesra)  
Energy Management and Auditing  
Renewable Sources of Energy  
Industrial Management



Dr. Abhijit Nag  
Assistant Professor  
Ph.D. (IIT Kharagpur)  
Machine Design  
Advanced Solid Mechanics



Dr. Om Prakash Pandey  
Assistant Professor  
Ph.D. (BIT Mesra)  
Energy Conversion System  
Fluid Mechanics & Hydraulic  
Machines



Dr. Richa Pandey  
Assistant Professor  
Ph.D. (BIT Mesra)  
Mechatronics  
Reverse Engineering



Dr. Om Prakash  
Assistant Professor  
Ph.D. (NIT Bhopal)  
Energy Conversion System  
Energy Storage Technology  
Thermodynamics

# Faculties

---



Dr. Paritosh Mahata  
Assistant Professor  
Ph.D. (IIT Kanpur)  
Theory of Elasticity  
Strength of Materials  
Rotor Dynamics



Dr. Nirmal Kumar  
Assistant Professor  
Ph.D. (IIT Kharagpur)  
Fracture Mechanics  
Strength of Materials  
Applied Dynamics & Vibration



Dr. Anil Chandra Mahato  
Assistant Professor  
Ph. D. (IIT-ISM Dhanbad)  
Automatic Control  
Robot Manipulator Design  
Robotics Engineering



Dr. Arun Kumar Kadian  
Assistant Professor  
Ph. D.(IIT Guwahati)  
Machine Design  
Kinematics & Dynamics of Machines  
Computational Methods



Dr. Mukesh Sharma  
Assistant Professor  
Ph. D.(IIT Roorkee)  
Refrigeration & Air Conditioning  
Energy Conversion System  
Power Plant Engineering







Dr. Arkadeb Mukhopadhyay  
Assistant Professor  
Ph.D. (Jadavpur University)  
Machine Design  
Applied Tribology  
Non-Destructive Testing



Mr. Praveen James Sanga  
Assistant Professor  
M.Tech. (IIT Delhi)  
Automobile Engineering  
IC Engine and Gas Turbine  
Non Conventional Energy



# Newly joined faculties

	Dr. Ritwik Maiti Assistant Professor	<ul style="list-style-type: none"> <li>• Post-docs (NUS, Singapore, and University of Sheffield, UK)</li> <li>• Ph.D. (IIT Kharagpur)</li> <li>• M.Tech. (Jadavpur University)</li> </ul>	<ul style="list-style-type: none"> <li>• Experimental Fluid Dynamics,</li> <li>• Multiphase flow,</li> <li>• Granular flow,</li> <li>• Discrete Element Model (DEM),</li> <li>• Computational Fluid Dynamics couple with DEM (CFDEM)</li> </ul>
	Dr. Saurav Chakraborty Assistant Professor	<ul style="list-style-type: none"> <li>• Post-doc (CSIR)</li> <li>• Ph.D. (IIT Delhi)</li> <li>• B.Tech. (IIT Bhubaneswar)</li> </ul>	<ul style="list-style-type: none"> <li>• Thermo-fluid-mechanical analysis (casting of steel)</li> <li>• Heat transfer and energy analysis of coal combustion</li> <li>• Design of Phase Change Material (PCM)</li> <li>• Volatile droplet impact on heated surface</li> </ul>
	Dr. Arun Kumar Sharma Assistant Professor	<ul style="list-style-type: none"> <li>• Post-doc (IISc Bangalore)</li> <li>• Ph.D. (IIT Kanpur)</li> <li>• M.Tech. (NIT Tiruchirappalli)</li> </ul>	<ul style="list-style-type: none"> <li>• Mechanical vibrations,</li> <li>• Modal analysis,</li> <li>• Inflatable structures,</li> <li>• Smart materials,</li> <li>• Composites,</li> <li>• Non- Destructive testing</li> </ul>
	Dr. Faisal Rahmani Assistant Professor	<ul style="list-style-type: none"> <li>• Ph.D. (IIT Delhi)</li> <li>• M.Tech. (IIT Delhi)</li> </ul>	<ul style="list-style-type: none"> <li>• Dynamics of rotor supported on journal bearings,</li> <li>• Powder lubricated journal bearings,</li> <li>• Surface textured journal bearings,</li> <li>• Dynamics of vehicle suspension system</li> </ul>

# Project completed and ongoing

<i>S. no.</i>	<i>Title of the project</i>	<i>Principal Investigator</i>	<i>Funding Agency</i>	<i>Amount (Rs)</i>	<i>Status</i>
1	DST Consoria project (Joint Project Proposal of VIT, Vellore, CLRI (CSIR) Chennai, and BIT, Mesra).	Dr. Rajeev Kumar	DST	Total Project Cost- 4.25 Cr. BIT Contribution 91 Lakhs	Ongoing
2	Cost effective building integrated photovoltaic thermal system with inbuilt water heating system	Dr. Om Prakash	TEQIP Collaborative Research Scheme	13.8 Lakhs	Completed
3	Unnat Bharat Abhiyan project	Dr. Rajeev Kumar	MHRD	7 Lakhs	Completed
4	Design and Development of a 6 DoF Gough-Stewart Platform for Virtual Simulators with Pneumatic Actuators	Dr. Arun Dayal Udai	SMC Pneumatics (India) Pvt. Ltd.	2.35 Lakhs	Completed
			Total	1.188 Crore	

# Applied Project

		Last Year – Present Year				
S No.	Name of Faculty	Role (PI/Co-PI)	Project Title	Amount	Funding Agency	Status
1	(i) Dr. Arkadeb Mukhopadhyay (ii) Dr. Arun Kumar Kadian	Co-PI	Centre of Excellence in Surface Engineering for Development of Wear and Corrosion Resistant Coatings on Engineering Components CESE	11.25 Cr	DST	Under Review
2	Dr. Paritosh Mahata	PI	Development of constitutive equation for understanding stress-strain behavior of biological cell membrane	25 Lakhs	SERB - CRG	Under Review
3	Dr. Kaushik Kumar	PI	Role of Hybrid Nanofillers on The Physio-Mechanical and Tribological Behavior of Polymer Nanocomposites for Load Bearing Advanced Mechanical Component Applications	49.5 Lakhs	DST SERB CRG	Under Review
4	(i) Dr. Apurba Kumar Roy (ii) Dr. Kaushik Kumar	PI Co-PI	Design and Development of Mixed Flow Pump Impeller Blades Under Hydrostatic, Structural and Thermal Loading Conditions.	23.74 Lakhs	DST SERB CRG	Under Review
5	Dr. Kaushik Kumar	Co-PI	Inclusive and Sustainable System Development Model For India MSME	13.2 Lakhs	CSR, CCL	Under Review
6	Lakhbir Singh brar	PI	Development of an innovative biomass drier: An experimental and CFD based investigation	25.11 Lakhs	SERB - CRG	Under Review
7	Lakhbir Singh brar	Co-PI	Experimental and CFD investigations for the assessment of indoor and outdoor air quality in Ranchi	39.68 Lakhs	SERB - CRG	Under Review
8	Dr. S. K. Dhiman	PI	Development of a portable air cooler using water without water evaporation and loss	1.8 Lakhs	DSIR-PRISM	Under Review

# Applied Project

Sl. No.	Name of Faculty	Role (PI/Co-PI)	Project Title	Amount	Funding Agency	Status
9	Dr. S. K. Dhiman	PI	Investigation of flow control past multiple cylinders by interstitial cylinders	33.8 Lakhs	DST-CRG	Under Review
10	Dr. S. K. Dhiman	Co-PI	Production of Hydrogen from Water Splitting by Nano-Photocatalyst and its Utilization in Dual-Fuel Diesel-Engines	6.37 Cr	DST-AHFCP	Under Review
11	Dr Richa Pandey	PI	Technological intervention for waste management using additive manufacturing and 3D printer for the upliftment and empowerment of rural women and youth	99.23 lakhs	CSR CCL	Under Review
12	Dr Richa Pandey	PI	Digital Conservation and Restoration of Cultural Heritage through Reverse Engineering and Rapid Prototyping	53.9 Lakhs	CSR CCL	Under Review
13	Dr. Om Prakash	PI	Design of a low cost, smart cold storage system for remote mining areas.	22 Lakhs	CSR-CCL	Under Review
14	(i) Dr. Om Prakash (ii) Lakhbir Singh brar	PI Co-PI	Investigation of Stones as Sensible Thermal Heat Storage Materials for Concentrated Solar Power Applications	33 Lakhs	DST	Under Review
15	Dr. Rajeev Kumar	PI	Establishing Biogas Plant in BIT Mesra for Supply of CBG through Agricutural Waste and Cowdung in nearby Villages of BIT Mesra for Self Sustainable on Energy	99.4 Lakhs	CSR-CCL	Under Review
16	Dr. Rajeev Kumar	PI	Creating an Employment Plan through Paper Carry Bags for Rural Women for Eradication of Polythene Bags from Ranchi Town	99.3 Lakhs	Jharkhand Govt.	Under Review
17	Dr. Mukesh Sharma	CO-PI	Development of high performance solar-gradient pond coupled with membrane distillation system for distillation of water.	42.72 Lakhs	DST	Under review
			Total	24.4 Crores		

# MoU

---

<i>Sl. No.</i>	<i>Organization</i>	<i>Year</i>
1	M/S Sabita Engineering Works, Tupudana Industrial Area, Hatia, Ranchi	2021
2	Council of Scientific and Industrial Research (Central Leather Research Institute, Chennai & Vellore Institute of Technology)	2019
3	IIT Delhi (Unnat Bharat Abhiyan)	2018
4	Delhi Technological University*	2021

\* Final stage

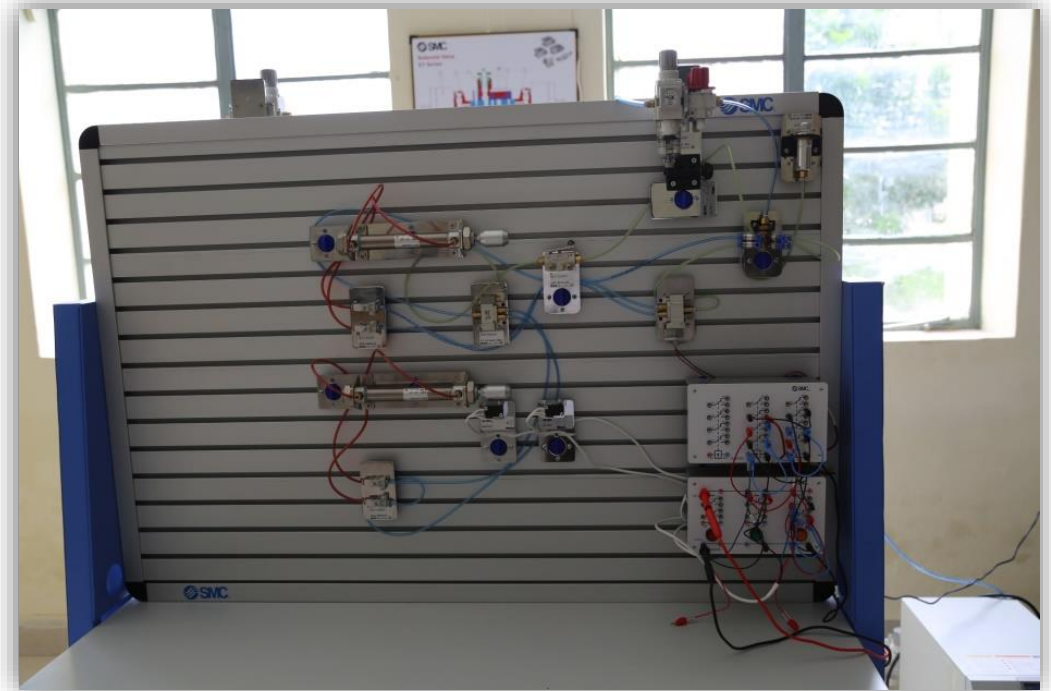


# Robotics Laboratory

---



Car Simulator

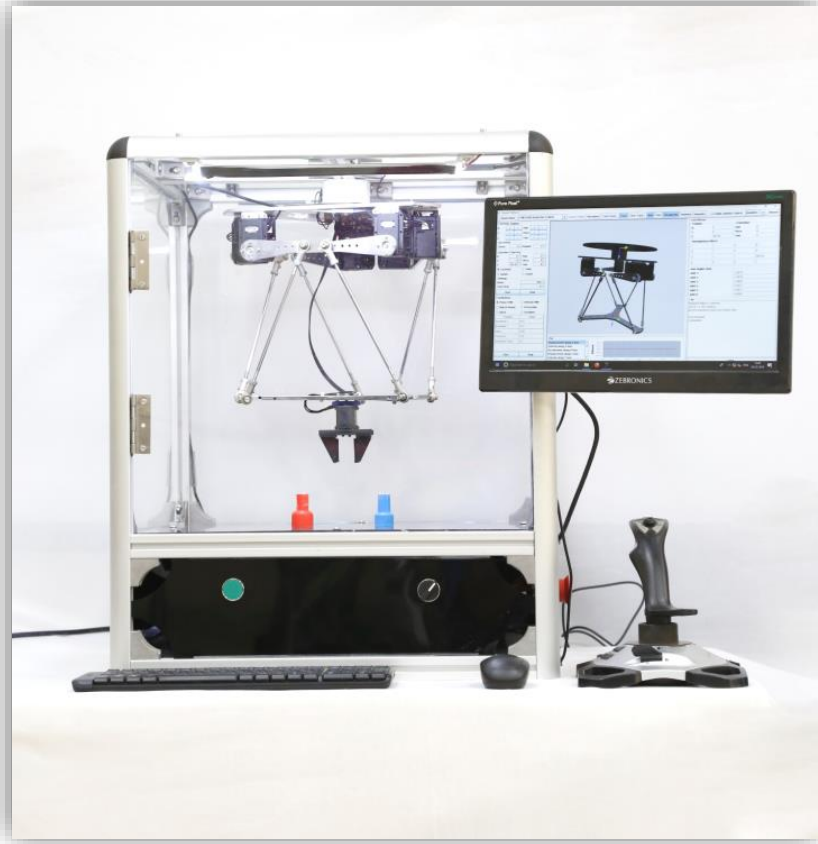


Electro-Pneumatic Control System

*Prof. in charge:*  
*Dr. Anil Chandra Mahto*  
*Dr. Nirmal Kumar*

# Robotics Laboratory contd...

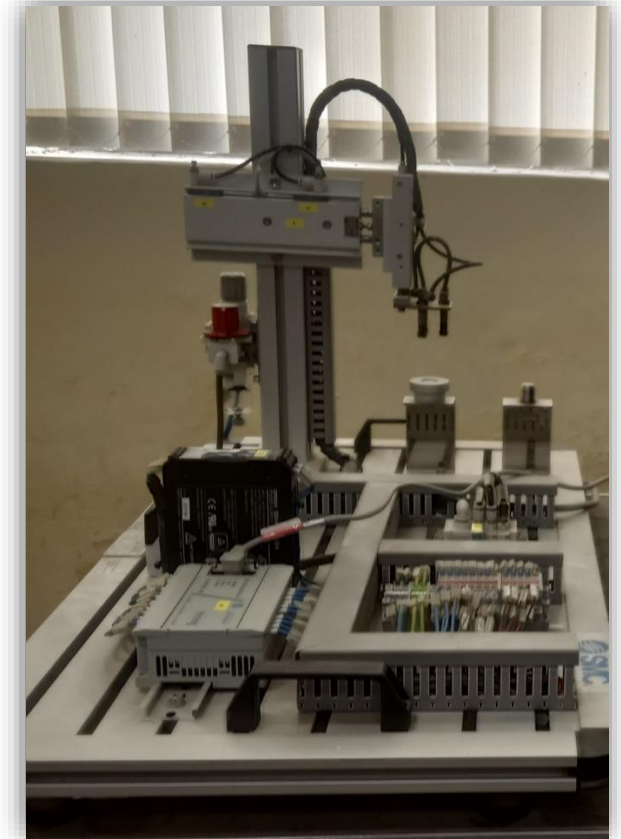
---



Pick and Place Electro-Pneumatic system



Kuka Robot



Electro-Pneumatic control system (PLC)

*Prof. in charge:*  
*Dr. Anil Chandra Mahto*  
*Dr. Nirmal Kumar*

# Advanced Solid Mechanics and Vibration Lab.

---



Digital Universal Testing Machine



Rumul Fatigue Testing Machine

*Prof. in charge:  
Dr. Rajeev Kumar*



# Computational Methods Laboratory

---



*No. of Terminal: 15*

## Software facilities

1. ANSYS
2. COMSOL Multiphysics
3. XFlow CFD
4. Matlab
5. Creo Parametric

*Prof. in charge:  
Dr. L. S. Brar*

# CAD Lab.

---



*No. of Terminal: 70*

## Software facilities

1. AUTOCAD 2020
2. ANSYS: MULTIPHYSICS
3. Creo-Parametric 1.0
4. NX-4
5. MATLAB
6. CATIA
7. LINGO
8. STAADPRO
9. ADAMS
10. ASPENTECH

*Prof. in charge:  
Dr. A. K. Roy*



# Fluid Mechanics Lab.

---



Francis Turbine



Multi-stage Centrifugal Pump



Reciprocating Pump test rig

*Prof. in charge:  
Dr. O. P. Pandey*

# Strength of Materials Lab.

---



Rockwell Hardness Testing



Brinell Hardness Testing



Charpy Impact Testing



Simply Supported Beam



Torsion Testing

*Prof. in charge:*  
*Dr. Sujeet Kr. Mishra*  
*Dr. Abhijit Nag*  
*Dr. Paritosh Mahata*

# Renewable Energy Lab

---



Solar water heater



Solar Thermal Training system



Solar PV Training & research system

*Prof. in charge:*  
*Dr. Praveen Mishra*  
*Dr. Om Prakash*



# Refrigeration Lab.

---



Pumpless vapour absorption system



Variable load VCRS test rig



Heating and cooling using Peltier module

*Prof. in charge:  
Dr. Mukesh Sharma*

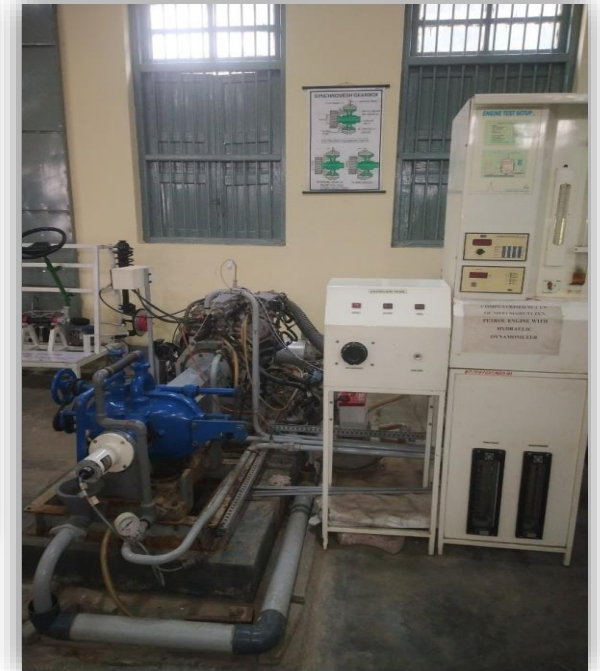
# Internal Combustion Engines Lab.



Computerized petrol engine test-rig with eddy current dynamometer



Mahindra diesel engine



Maruti zen MPFI petrol engine



Computerized CRDI Engine test rig



Exhaust Gas Analyser

*Prof. in charge:  
Dr. Mukesh Sharma*

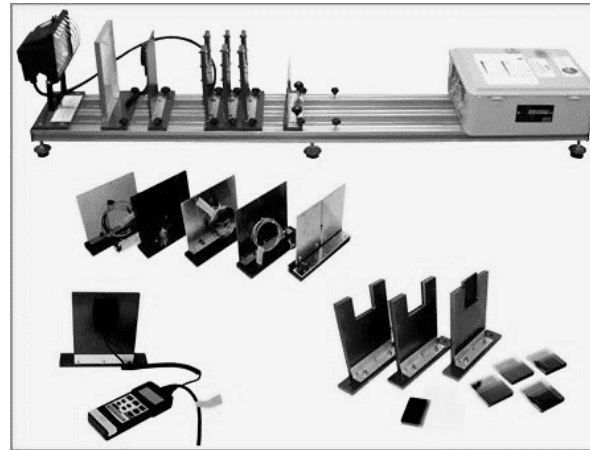


# Heat Transfer Lab

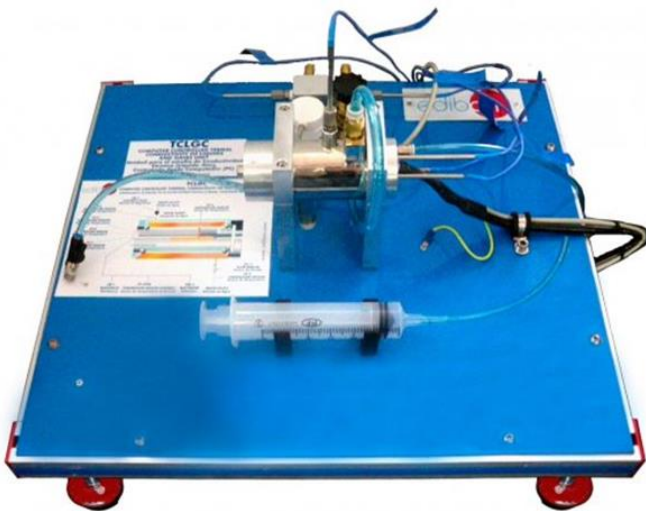
*Prof. in charge:  
Dr. S. K. Dhiman*



DAQ assisted Temperature Calibration unit and Simulator



DAQ assisted Heat Radiation experiment series

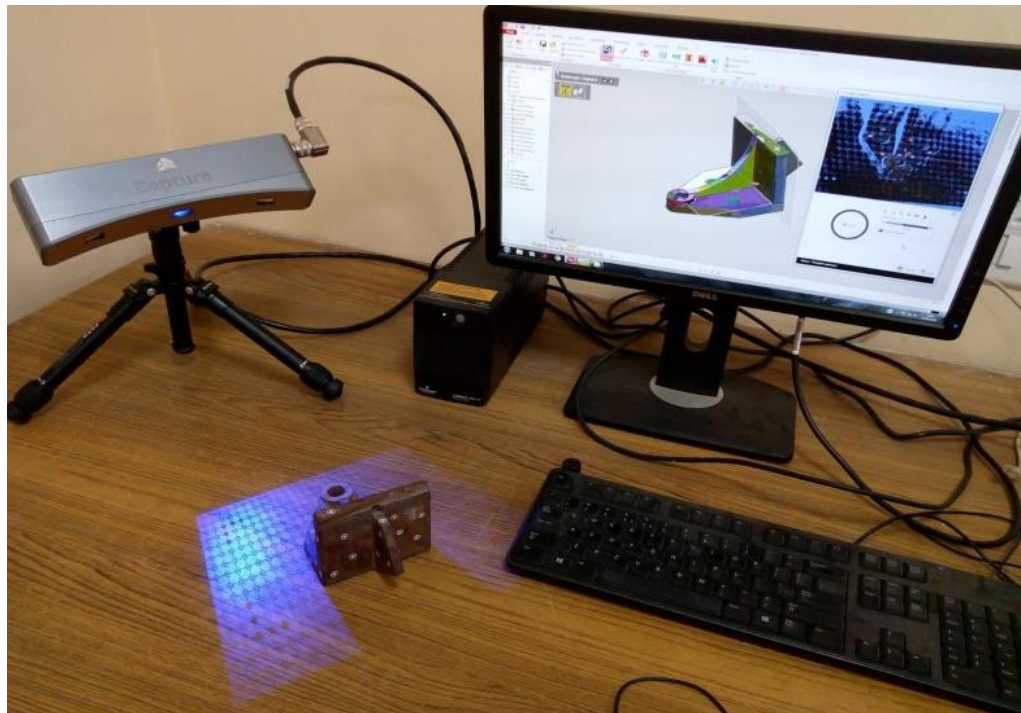


DAQ assisted Computerized control Heat Transfer training system

# Reverse Engineering Lab

---

## 3D Scanning



*Prof. in charge:  
Dr. Richa Pandey*

## 3D Printing



# Research Domains

---

## Internal Combustion Engines

- Dr. R. P. Sharma
- Dr. Rajeev Kumar

## Computational Fluid Dynamics

- Dr. D. P. Mishra
- Dr. A. K. Roy
- Dr. L. S. Brar

## Renewable Energy

- Dr. Om Prakash
- Dr. Praveen Mishra
- Mr. Praveen J Sanga
- Dr. O. P. Pandey

## Heat Transfer

- Dr. S. K. Dhiman
- Dr. Saurav Chakraborty

## Multiphase Flows

- Dr. A. K. Roy
- Dr. Mukesh Sharma
- Dr. Ritwik Maiti

## Composite Materials and coatings

- Dr. Arkadeb Mukhopadhyay
- Dr. Kaushik Kumar
- Dr. Sujeet K Mishra

## Biomechanics

- Dr. Nirmal Kumar
- Dr. Richa Pandey
- Dr. Paritosh Mahata

## Pneumatics and Hydraulics

- Dr. Anil C Mahato
- Dr. Abhijit Nag

## Finite Element Method

- Dr. Arun K Kadian
- Dr. L. S. Brar

## Dynamics and Vibration

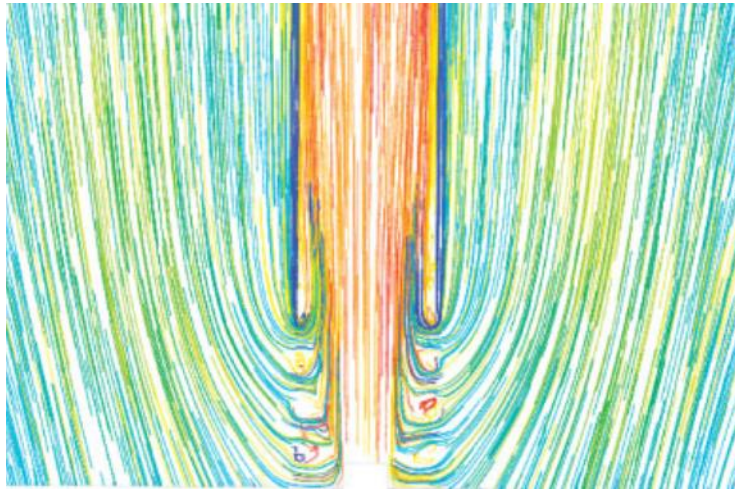
- Dr. Nirmal Kumar
- Dr. Faisal Rahmani
- Dr. Arun K Sharma

## Reverse Engineering

- Dr. Richa Pandey

# Infrared suppression device

---

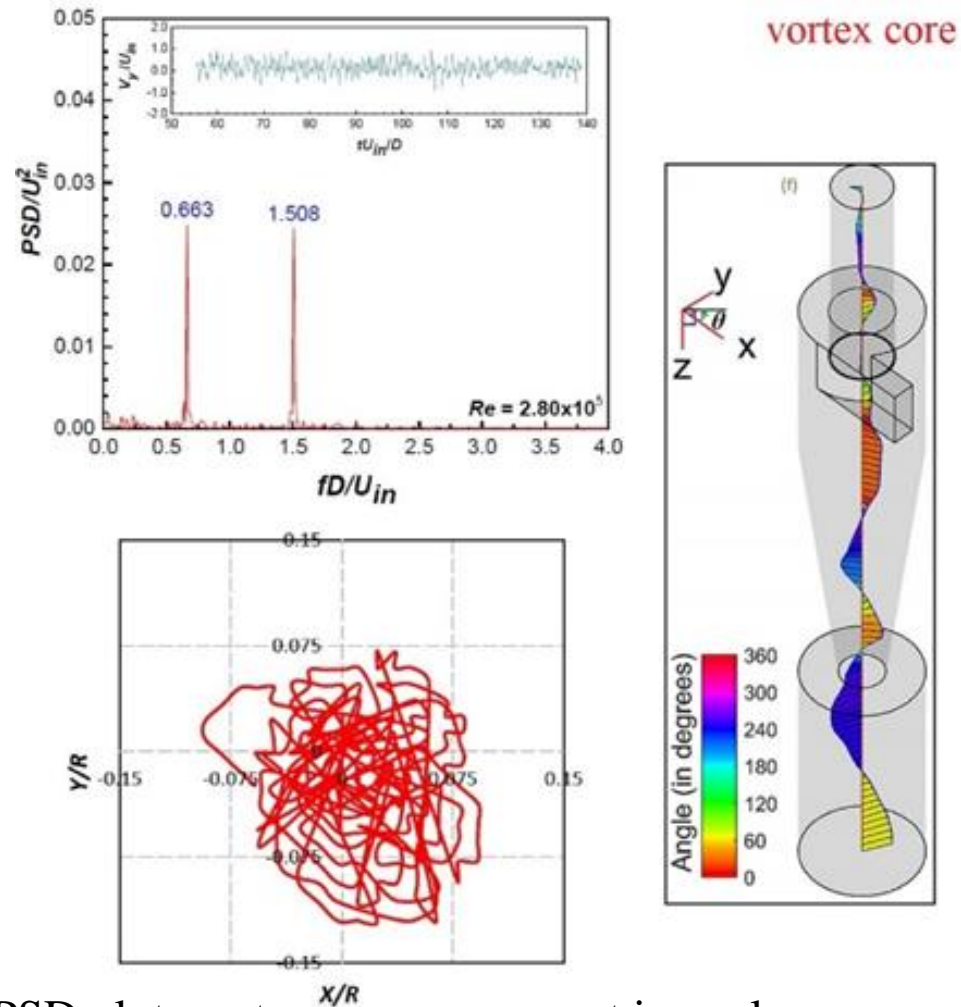


Air entrainment into an infrared suppression device to reduce the exit temperature of exhaust emissions expelled to the surroundings through a funnel of war ship

- IRS device generally used in war ship to reduce the temperature of hot combustion products come out from the gas turbine exhaust. This has a great importance in defense system where the naval ship can use it.



# Performance of a cyclone separator using CFD

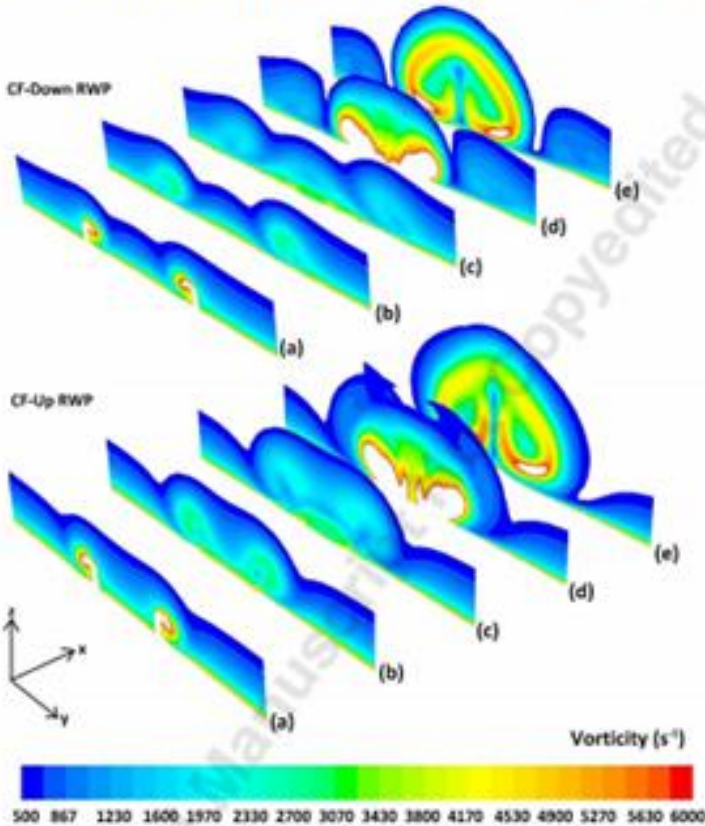


PSD plot, vortex core movement in cyclone separator.

- Cyclone separators are employed to remove the suspended particles from the gas streams in several industries before the gas is finally released into the atmosphere
- The general cyclone design is used to remove particles in a range of 10 to 50 microns, whereas the high-efficiency units can remove the particles of size less than 3 microns.
- Since these suspended solid particles in the air could adversely affect human health by penetrating deep into the respiratory system, therefore, a good, optimized cyclone geometry would increase the safety factors to a greater extent (especially in the industrial areas).

# Effect of hole shapes, orientation, and hole arrangements on film cooling in gas turbine blades

Flow vorticity induced by the RWP at different cross plane locations



Flow vorticity induced by the RWP at different cross plane locations for providing cooling solution in gas turbines.

- The cooling solution will allow the designers to use higher thermal energy gas turbines without affecting the structural property of the materials to achieve better overall performance of gas turbines.



# Performance analysis of an IC engine using enriched biodiesel

---

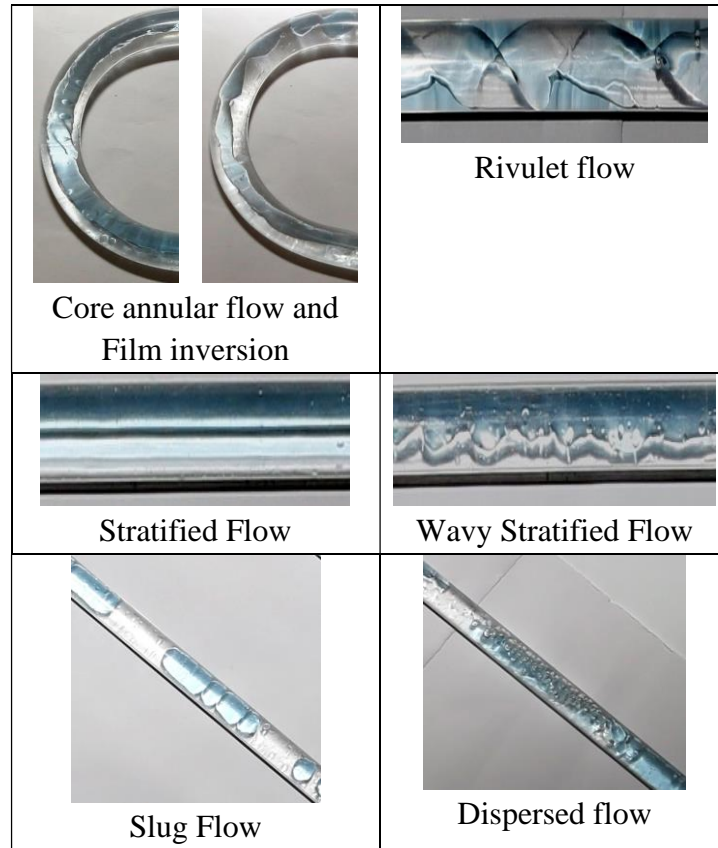


- Enriched biodiesel can be used as alternate fuel to diesel.
- Biodiesel can be employed in diesel engine with minimum engine modifications.

Experimental test set-up for performance analysis of enriched biodiesel as an alternative to conventional fuel.

## Liquid- liquid flows through conduits coupled with return bend.

---



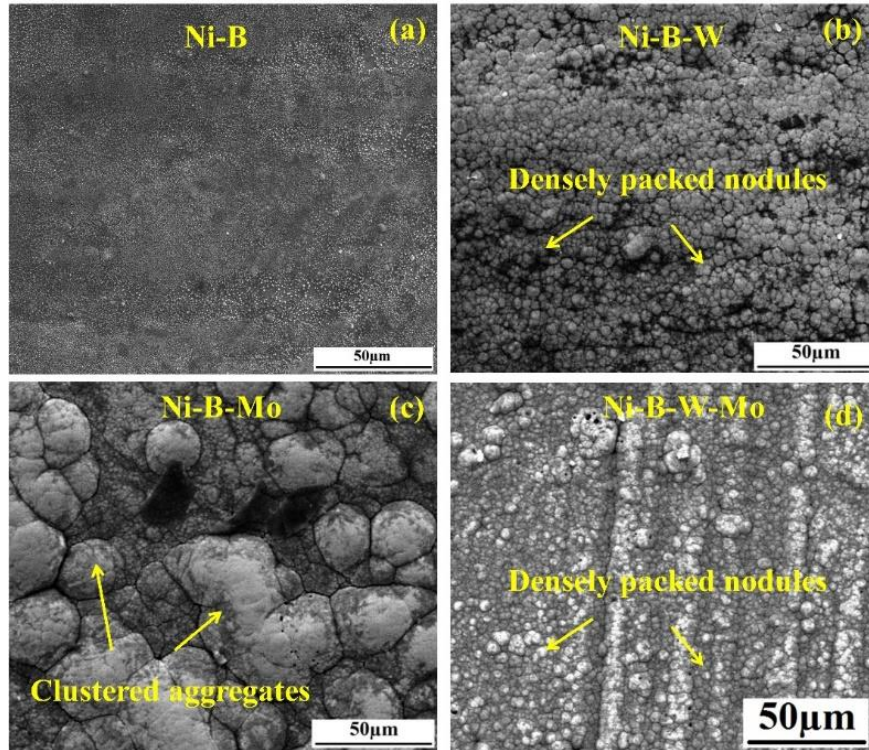
Experimental test set-up for observing Various flow patterns developed for estimation of pressure drop in crude oil transportation.



The estimation of pressure drop and by visual observation of flow pattern during the oil-water flows with return bends will be useful for the petroleum industries to reduce the pumping cost and to design an economical pipe network for crude oil transportation.

# Development of wear and corrosion resistant coatings

---

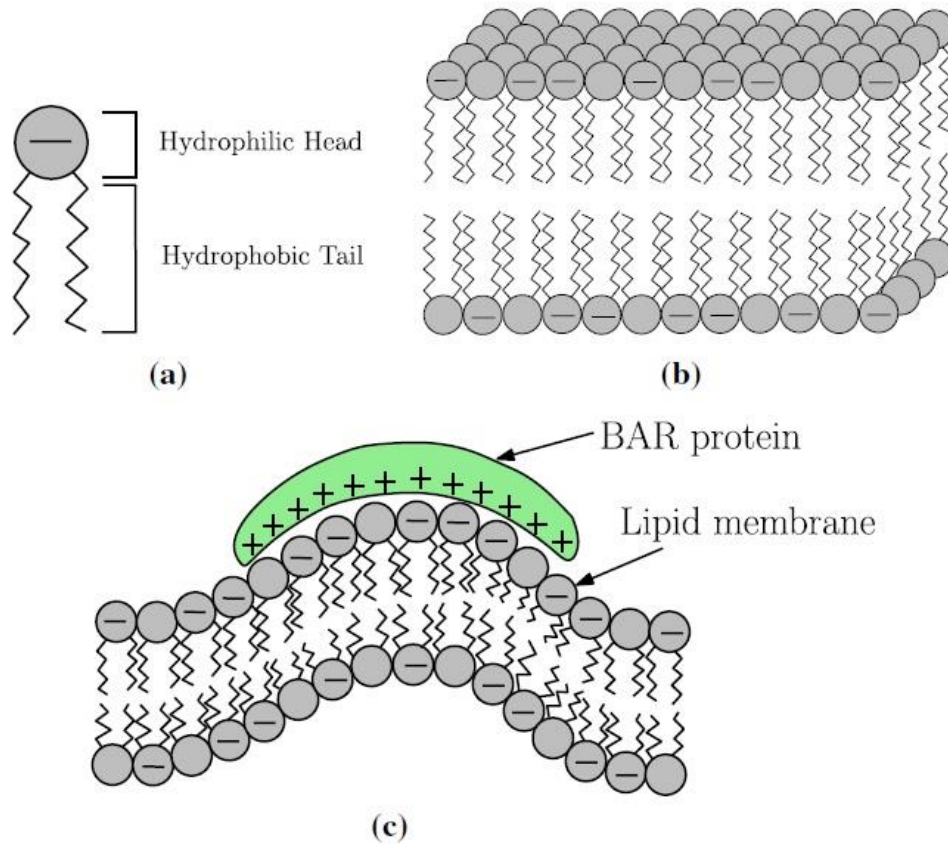


Ni-B based alloy coatings with high wear resistance for automobile and slurry pump components.

- Improvement in surface properties of base material without affecting its bulk properties.
- Ability to coat a wide variety of substrates including plastics and complex shapes.
- High wear resistance and low COF leads to improvement in life of sliding components.
- Environment friendly alternative to chromium coatings that are commonly used for corrosion protection of rebars.



# Mechanical Modeling of Bio-systems

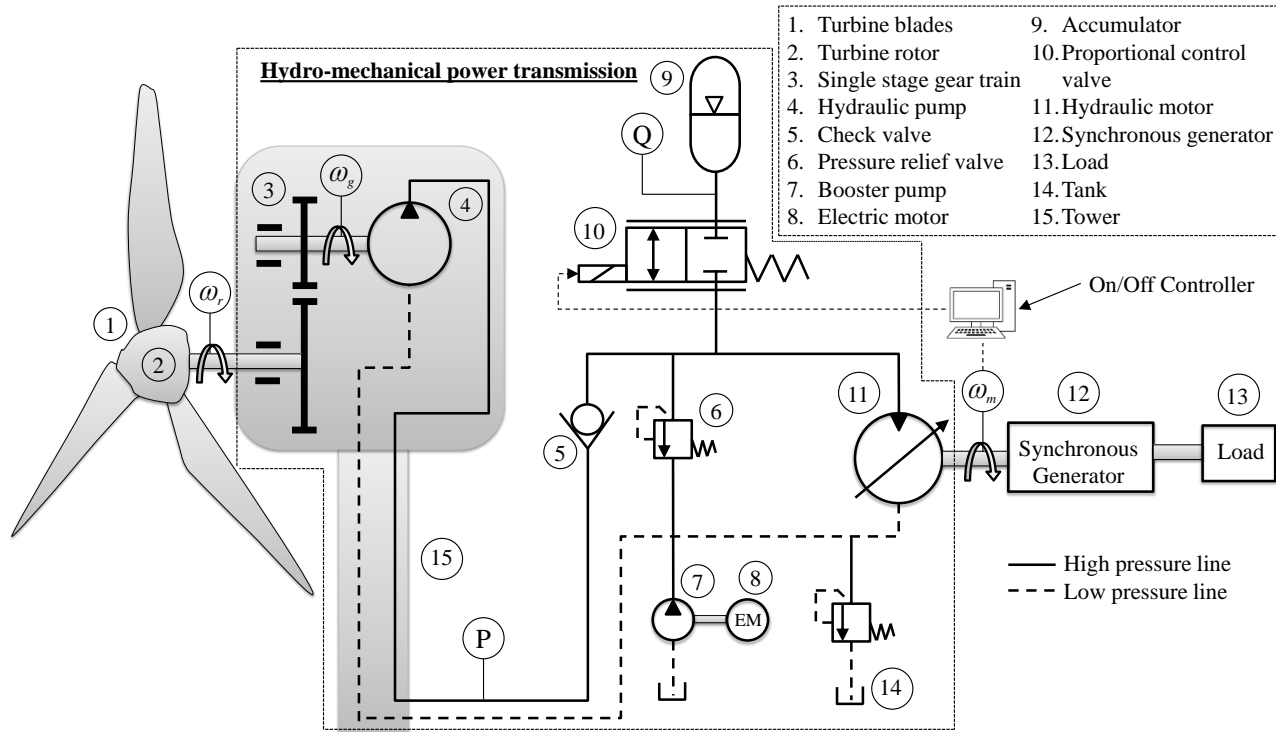


Schematic representing (a) lipid molecule, (b) lipid membrane, and (c) BAR protein binding with lipid membrane due to electrostatic interaction.

- Understanding binding mechanism between protein and cell membrane helps us to go into the insight of several cell-biological processes like endocytosis, exocytosis, and intracellular membrane trafficking.
- Helpful in cancer therapy, drug delivery, etc.
- Analyze problems in electrophotography, powder technology, semiconductor and pharmaceutical industries.
- The study focused on endocytosis of SARS-CoV-2 can help one to understand endocytosis process involved in different viral infections.



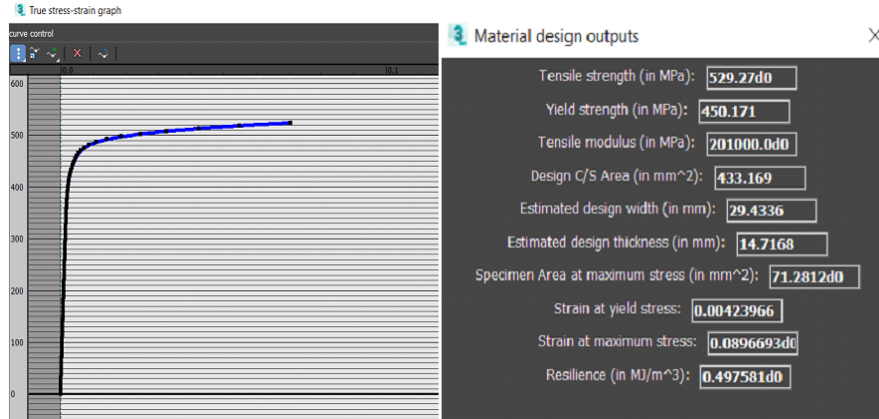
# Reduction of power fluctuation in wind turbines using hydromechanical transmission system



Schematic diagram of proposed wind turbine power development system with hybrid hydro-mechanical power transmission.

- The proposal has an importance regarding energy saving.
- It reduces the waste energy from the system and improves the power supply of the wind turbine.
- It reduces the probability of load shedding whenever the input wind speed is insufficient.

# Natural Fibre Reinforced bio-degradable Polymeric Composites and a Virtual Material Testing Laboratory



Stress-strain curve and program outputs for C450



Fabricated Tiles

- Replacement to the conventional ceramic floor tiles and adopting green technology.
- The developed software in modular form can be used by students, researchers and scientist for material properties prediction and would be a part of Industry 4.0.

Composite material and output of virtual testing for development and testing of novel composite materials.

# Detection and identification of a Crack in a Rod

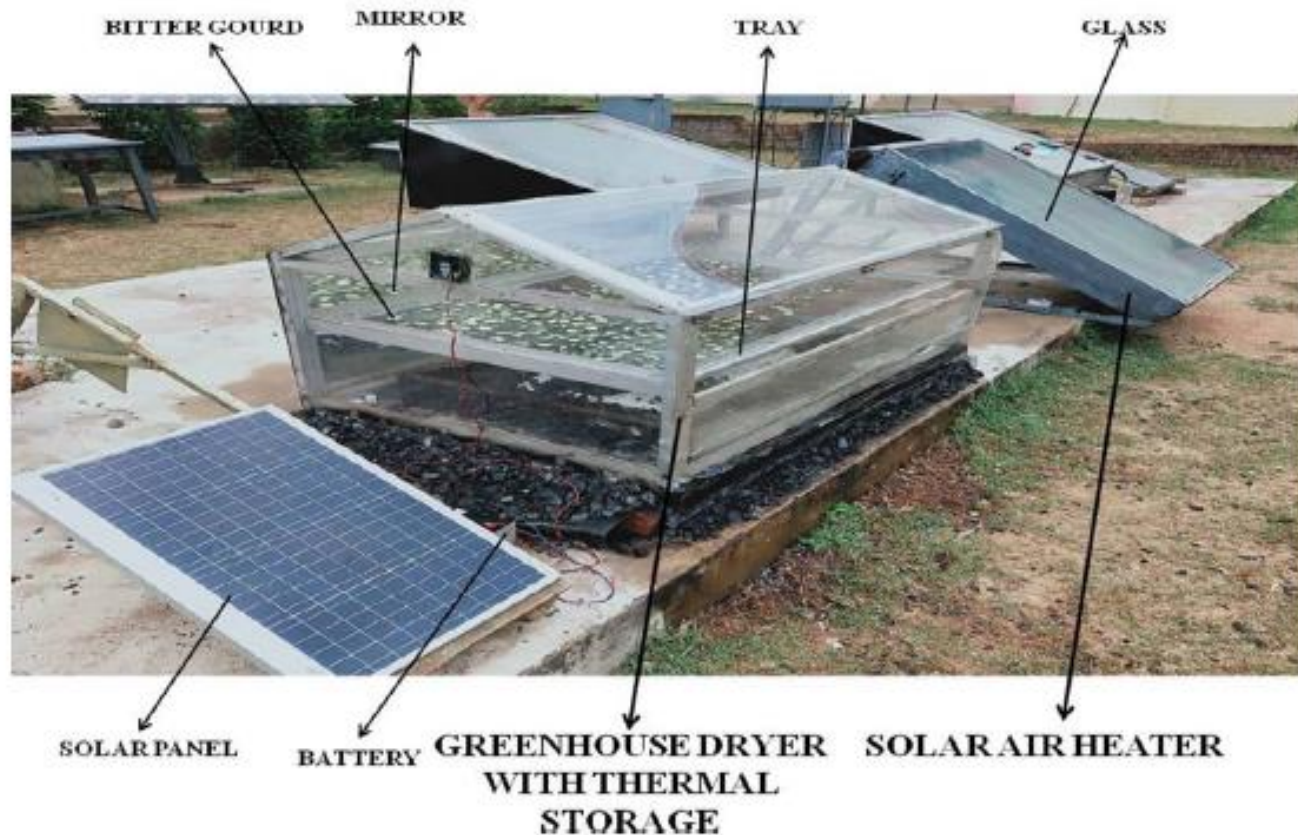
---



Experimental test facility for Fatigue test.

- To determine the running life and fatigue crack propagation of a component subjected to cyclic loading.
- Using natural frequency drop method one can find the severity of crack in running condition.

# Cost effective building integrated photovoltaic thermal system with inbuilt water heating system



Hybrid Greenhouse Dryer with mixed thermal storage for bitter gourd drying

- Mixed thermal storage which is mixture of sensible and latent heat storage material
- Useful for low and medium thermal drying
- Solar air heater coupled with greenhouse dryer to provide preheated air.
- North wall is made opaque with the help of mirror.



# Development of hip implant through reverse engineering and additive manufacturing

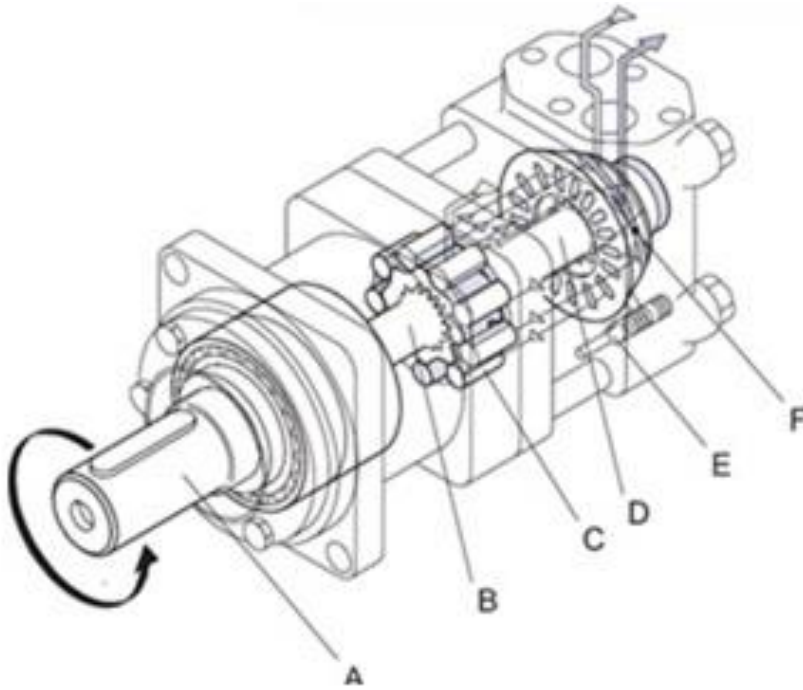
---

## Hip Joint Replacement



- Giving a platform to the new generation for new adventures in Biomedical Aids.
- Making some new implants fast and custom fit fabrication.
- Revolutionizing the engineers to take challenges in materials and value engineering.

# Design of Hydrostatic fluid power equipment – Orbit motor



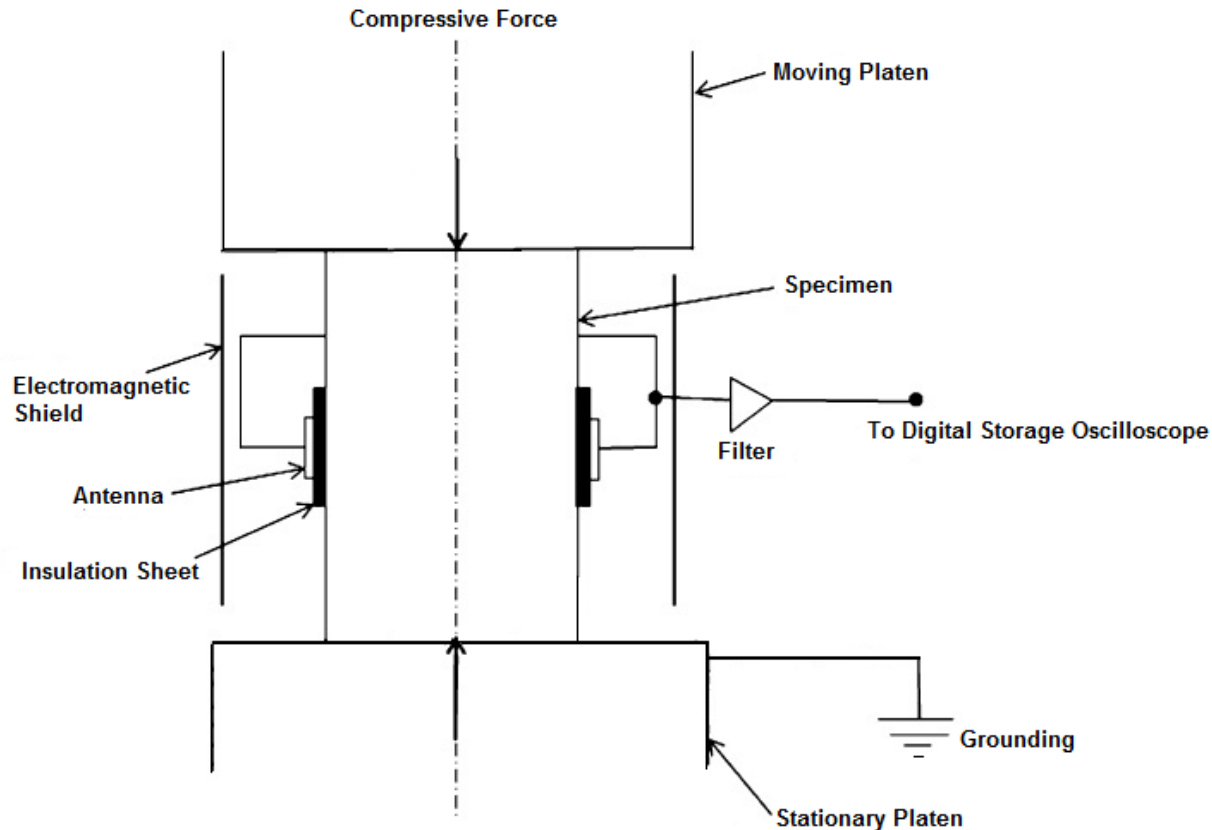
**A: OUTPUT SHAFT B: CARDAN SHAFT-1 C: STAR-RING SET**  
**D: CARDAN SHAFT-2 E: DRAIN PATH F: FLOW DISTRIBUTOR VALVE**

Epitrochoid generated Rotor-Stator and an Orbital Hydrostatic Unit.

- Orbital motors are ideal for heavy loaded equipment used in:
  - agricultural,
  - road building,
  - construction,
  - forestry,
  - public utility and
  - lawn and garden equipment.
- This research would help in improving the efficiency of orbit motor, reduce losses and thereby improving cost-effectivity of the applications mentioned above.

# Electromagnetic radiation emission during plastic deformation in metals, alloys, and sintered powder metals

---



Test set up with antenna configuration for the detection of EMR emission under quasi-static compression of cylindrical specimen.

- The EMR emission may have wide application in industry. By EMR emission crack initiation/failure of the component can be easily detected by using a sensor.
- Once the plastic deformation of the components starts the EMR emission will be there which will predict the life of the component and corrective measures may be used to save the component.

# Flow and heat transfer characteristics for flow past bluff bodies

---



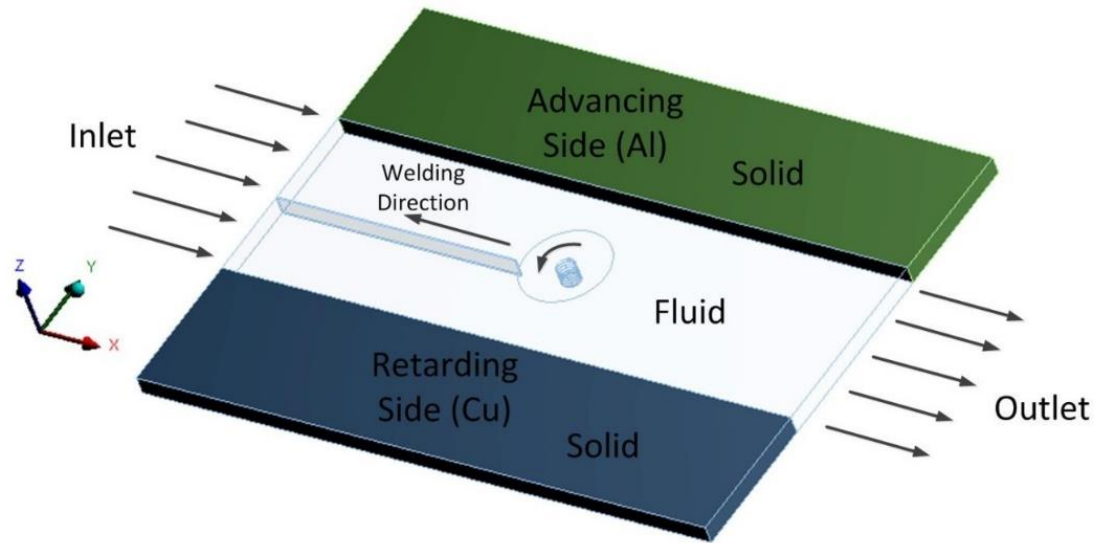
Crossflow heat exchanger facility for heat transfer applications

- Direct and inverse thermal modelling, flow and thermal measurements, visualization of flow structures, etc. are the fundamental need of research in the domain of flow and thermal based applications
- Industries will be benefitted with the research as this provides an optional design in thermal applications.



# FEM Modeling and Experimental Analysis of Friction Stir Welding

---

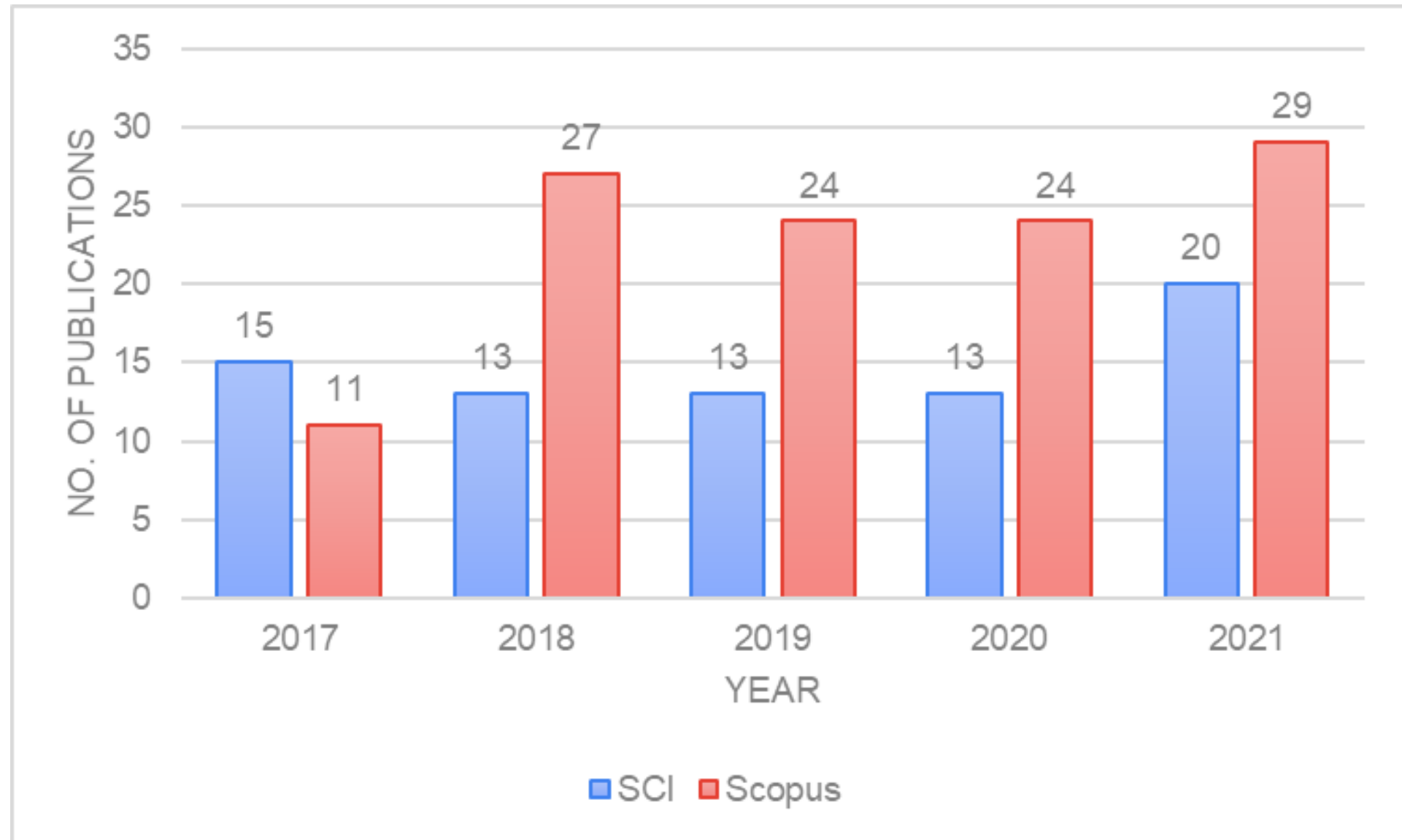


The Schematic diagram used in material flow model of dissimilar FSW

- Provided the insight of the process
- The obtained knowledge can be utilized to design the tool geometry.
- Extremely useful in making rectification of defected weldment.

# No. of Publications

---



SCI: 74

Scopus: 115



Thank you

---