

CONFERENCE PROGRAM



International Conference on Thermo-Fluids and System Design

ICTFSD 2024

04 - 05 April 2024

Department of Mechanical Engineering
Birla Institute of Technology
Mesra, Ranchi-835215, Jharkhand

Publication Partners



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DAY 1: 04.04.2024

INAUGURAL SESSION, 09:00 AM to 10:00 AM

Venue: R&D Seminar Hall 2

Arrival of Honourable Vice Chancellor, Chief Guest, Guest of Honour and other dignitaries	9:00 AM - 9:05 AM
Presentation of bouquet to the distinguished guests and lighting the lamp	9:05 AM – 9:10 AM
BIT Institute prayer	9:10 AM - 9:15 AM
Overview of ICTFSD 2024 by the Organising Secretary	9:15 AM - 9:20 AM
Overview of the Mechanical Engineering Dept., by Prof. Apurba Kumar Roy , HOD, ME	9:20 AM – 9:30 AM
Welcome Address by Prof. Indranil Manna , Vice Chancellor, BIT Mesra, Patron, ICTFSD 2024	9:30 AM - 9:40 AM
Address by Guest of Honor, Prof. Prasanta Kumar Das (FNAE, FNASc) Professor, Indian Institute of Technology Kharagpur, India	9:40 AM - 9:55 AM
Address by Chief Guest, Prof. Gautam Biswas (FNA, FASc,FNAE,FASME,FNASc,FIE) J C Bose National Fellow and Professor, Indian Institute of Technology Kanpur, India	9:55 AM - 10:10 AM
Presentation of Momento to the Distinguished Guests and Vote of Thanks by Convener	10:10 AM - 10:15 AM

DAY 1: 04.04.2024

Keynote Speech 1, 10:15 AM to 11:00 AM

Prof. Gautam Biswas (Indian Institute of Technology Kanpur, India)

Venue: R&D Seminar Hall 2, **Topic:** Film Boiling

1st Session: 11:00 AM to 11:45 PM

<p>Session 1A: (Track 1A) Session Chair: Dr. Shital Garg Venue: R&D Seminar Hall 1</p>	<p>Session 1B: (Track 1B) Session Chair: Dr. Faisal Rahmani Venue: R&D Seminar Hall 2</p>	<p>Session 1C: (Track 2) Session Chair: Dr. Paritosh Mahata Venue: T&P Seminar Room</p>
<p>1.Performance of the Helical Hydrokinetic Turbine-A Review. 2.Heat transfer analysis around a heated tube under cross flow of air. 3.Study of Flow Regime and Flow Patterns in Inverted U Bend.</p>	<p>1.Enhancement of specific heat capacity of silica nanofluids synthesized in nitrite-nitrate ternary salt for concentrated solar power applications. 2.Performance of silicon and nitrile rubbers in the constrained layer damping using fractional order derivative constitutive model. 3.Post Processing of Waste Plastic after Shredding from a Shredder for Efficient Use in Construction Materials.</p>	<p>1.Numerical study of viscoelastic drop impact on a non-wetting heated surface. 2.Newtonian bubble rise in a viscoelastic surrounding fluid in a channel with imposed wall temperature variation. 3.CFD Investigation on the Efficacy of Horizontal and Vertical Air Curtain Systems in Refrigerated Room.</p>

High Tea: 11:45 AM to 12:00 PM

DAY 1: 04.04.2024

Keynote Speech 2, 12:00 PM to 12:45 PM

Prof. Pradip Dutta (Indian Institute of Science, Bengaluru, India)

Venue: R&D Seminar Hall 2, **Topic:** Sorption-based Heating And Cooling Systems

2nd Session: 12:45 PM to 01:30 PM

Session 2A: (Track 1A) Session Chair: Dr. S. K. Dhiman Venue: R&D Seminar Hall 1	Session 2B: (Track 1B) Session Chair: Dr. Kaushik Kumar Venue: R&D Seminar Hall 2	Session 2C: (Track 2) Session Chair: Dr. Rajeev Kumar Venue: T&P Seminar Room
<ol style="list-style-type: none">1.Numerical investigation on thermal performance of PCM based triple tube heat exchangers using different types of fins.2.Study on different grouting materials for efficiency enhancement of geothermal energy systems.3.Two phase flow modelling of a bubble impact on flat plate.	<ol style="list-style-type: none">1.Optimization Driven Fault Detection: A Comprehensive Study on the Health of Bearings.2.An Investigation of Prototype Development using 3D Printer: A Digital Fabrication Approach.3.Optimizing Cyclone Separator Design for Selective Particle Size Removal	<ol style="list-style-type: none">1.Development of an Energy Regenerative Technology for the Swing Mechanism of a Hydraulic Excavator Machine and its Performance Analysis using Simulation Technique.2.Multiphysics Modeling of Thermoelectric Unicouple and Comparison of Electrical Performance with Different Thermoelectric Materials.3.Optimizing Thermal Management in Hydraulically Operated Fan Drive Systems: A Comparative Study.

Lunch Break: 01:30 PM to 02:30 PM, Venue: International Guest House (IGH)

DAY 1: 04.04.2024

Keynote Speech 3, 02:30 PM to 03:15 PM

Dr. Shital Garg (Defence Research & Development Organisation, India)

Venue: R&D Seminar Hall 2, **Topic:** Advances in Miniature Cryocoolers

3rd Session: 03:15 PM to 04:15 PM

Session 3A: (Track 1A) Session Chair: Dr. Apurba Kumar Roy Venue: R&D Seminar Hall 1	Session 3B: (Track 1B) Session Chair: Dr. Ritwik Maiti Venue: R&D Seminar Hall 2	Session 3C: (Track 2) Session Chair: Dr. R. P. Sharma Venue: T&P Seminar Room
<ol style="list-style-type: none">1.Study of pressure distribution around circular cylinders2.2D wake transition of NACA 0012 airfoil in soap film for low Reynolds number.3.Design, development & CFD modelling of thermal oil based parabolic trough collector.4.Alternative brain cancer treatment using tumor treating fields: A computational approach.	<ol style="list-style-type: none">1.Properties and Characterization of Nanocellulose.2.Strengthening 5th Series Aluminum Alloy with Silicon Carbide: A Stir Casting Approach .3.Tribological Properties of Nanolubricants Utilizing Graphene Oxide Nanosheets Prepared by Ball Milling.4.Enhancing Dynamic Control of Left Ventricle Pressure through High-Capacity Pump Integration	<ol style="list-style-type: none">1.Design and development of collapse model for ring-stiffened cylinders under hydrostatic pressure.2.Performance Analysis of Two Flow Control Strategies for Hydraulic Position Control.3.Optimizing Closed-Circuit Hydrostatic Transmission Systems through Thermal Modeling.4.Harnessing Hydrogen: A Comprehensive Examination of Fuel Cell Vehicles

Tea Break: 04:15 PM to 04:30 PM

DAY 1: 04.04.2024

Keynote Speech 4, 04:30 PM to 05:15 PM

Prof. Zhixiong (James) Guo (Rutgers, The State University of New Jersey, USA) - Online

Venue: R&D Seminar Hall 2, **Topic:** Interfacial Heat Transport in Semiconductor Heterostructures

Meeting Link click here : **Meeting ID:** 419 200 375 257, **Passcode:** 9rYPzo

Keynote Speech 5, 05:15 PM to 06:00 PM

Prof. Prasanta Kumar Das (Indian Institute of Technology Kharagpur, India)

Venue: R&D Seminar Hall 2, **Topic:** Nexus between Human Thermoregulation And Cardiovascular Operations

4th Session: 06:00 PM to 06:45 PM

Session 4A: (Track 1A) Session Chair: Dr. Mukesh Sharma Venue: R&D Seminar Hall 1	Session 4B: (Track 1B) Session Chair: Dr. Abhijit Nag Venue: R&D Seminar Hall 2	Session 4C: (Track 1A) Session Chair: Dr. Arbind Kumar Venue: T&P Seminar Room
<ol style="list-style-type: none">1.Effect Of Temperature On Low Rotational Speed Performance Of External Gear Pump.2.A Review on Cushioning Characteristics in High-Speed Hydraulic Actuators.3.Numerical Investigation of Droplet Spreading on Curved Surface Using Lattice Boltzmann Method.	<ol style="list-style-type: none">1.An experimental investigation on the effect of filler form and temperature on compressive strength of epoxy composites.2.Analysis of Sandwich Composite Subjected to Impact Loading for enhanced Energy Absorption.3.Statistical Analysis of Input Parameters and their Interaction on Surface Roughness in Incremental Sheet Metal Forming.	<ol style="list-style-type: none">1. Design for a Horizontal Ground Heat Exchanger Using a Centrifugal Pump.2. Multi-objective optimization of fin and tube heat exchanger with diagonally aligned straight winglets for performance enhancement.3. Performance analysis of Plate type Steam Condenser Using Nano-fluid.

END OF DAY 1 with HIGH TEA

DAY 2: 05.04.2024

Keynote Speech 6, 09:00 AM to 09:45 AM

Dr. Jeevanjyoti Chakraborty (Indian Institute of Technology Kharagpur, India)

Venue: R&D Seminar Hall 2, **Topic:** Interplay of Diffusion, Growth & Mechanics in Lithium-Ion Battery Electrode Particles

5th Session: 09:45 AM to 10:45 AM

Session 5A: (Track 1A) Session Chair: Dr. Praveen J. Sanga Venue: R&D Seminar Hall 1	Session 5B: (Track 1B) Session Chair: Dr. Anupam Roy Venue: R&D Seminar Hall 2	Session 5C: (Track 1A) Session Chair: Dr. Sanat Mukherjee Venue: T&P Seminar Room (online)
<ol style="list-style-type: none">1.Effect of septal correction on nasal aerodynamics – An Invitro Experimental and Numerical investigation.2.Heat transfer through a heated rod placed in different arrangements.3.Parametric Investigation of PIG Travel in Subsea Pipelines – A CFD Approach.4.Effect of aspect ratio on laminar flow in an internal shear driven system of 2-D lid-driven cavity.	<ol style="list-style-type: none">1.Comparative study and characterization of the products formed by the interaction of D-Ribose with TBC in DMF & DMSO as the solvent..2.Assessing Formability Behavior of High-Strength Thermal Resistant (HSTR) Alloys.3.A performance analysis of wind turbine blade with changing pitch angle by using FSI.4.Influence of Natural fiber on drop weight Impact test of Hybrid fiber Reinforced Concrete.	<ol style="list-style-type: none">1.Analysis of Combustion Characteristics of Can-Type and Annular-Type Combustion Chamber.2.Estimation of energy available in rain droplets from meteorological rainfall data.3.Thermal Management of Microelectronics Using Microchannel Heat Sink with Inclined Geometry and CNT-based Nanofluid.4.Design, Fabrication and Aerodynamic Analysis of a RC Aeroplane.

High Tea: 10:45 AM to 11:00 AM

Online Training session by **COMSOL**: 11:00 AM to 11:30 AM

Venue: R&D Seminar Hall 2

Meeting Link click here : **Meeting ID:** 419 200 375 257, **Passcode:** 9rYPzo (same link for session 5C)

DAY 2: 05.04.2024

Keynote Speech 7, 11:30 AM to 12:15 PM

Prof. P. P. Bandopadhyay (Indian Institute of Technology Kharagpur, India)

Venue: R&D Seminar Hall 2, **Topic:** High-velocity Oxygen Fuel (Hvof) Sprayed Wc-co Coatings

6th Session: 12:15 PM to 01:30 PM

Session 6A: (Track 1A)

Session Chair: **Dr. Nirmal Kumar**

Venue: **R&D Seminar Hall 1**

1. Investigating the Thermal Modeling of a Parabolic Trough Solar Collector using Therminol VP-1 oil using Al₂O₃ nanoparticle as Heat Transfer Fluid.
2. Optimization of probe positioning in radiofrequency ablation of heterogeneous human brain tumor: A numerical heat transfer study.
3. CFD simulation of a Lithium-Ion battery pack with air-cooling and water-cooling types of battery thermal management systems under high discharge rate condition.
4. Design of a Tailsitter VTOL UAV and Investigating the Aerodynamic Performance using CFD techniques.
5. Integrated Furnace Modeling and Circulation Analysis of Natural Circulation Hybrid Boiler

Session 6B: (Track 1B)

Session Chair: **Dr. Arun Kadian**

Venue: **R&D Seminar Hall 2**

1. Finite Element Analysis of a Beam Resting on a Layered Soil.
2. Design and development of collapse model for ring-stiffened cylinders under hydrostatic pressure.
3. An investigation of the deformation caused by balls in a flexible race ball bearing using a 2D numerical method .
4. Design and development of a hybrid finite element analysis based model for impact analysis of blasts on underwater.
5. Deformation and volume change of axisymmetric non-linear dielectric elastomer membranes: a theoretical study

Session 6C (Track 1A)

Session Chair: **Dr. Saurav Chakraborty**

Venue: **T&P Seminar Room (Online)**

1. Fluid Flow CFD Analysis of Orifice Meter.
2. Advancements in various methods for turbulence prediction in transitional flow.
3. Comparison of Latent Heat Storage Unit (LHSU) Designs Utilized with Low-Temperature Solar Air and Water Heating Systems.
4. Thermohydraulic Performance Analysis of A Rectangular Fluid Flow Channel With A Variety of Turbulence Geometries.
5. Advances in Stirling Engine Engineering:
I. Finned Cylinder Walls for Improved Cooling.

Lunch Break: 01:30 PM to 02:30 PM, Venue: International Guest House (IGH)

Meeting Link for Session 6C click here : Meeting ID: 419 200 375 257, Passcode: 9rYPzo

DAY 2: 05.04.2024

Keynote Speech 8, 02:30 PM to 03:15 PM

Dr. Tanmoy Mukhopadhyay (University of Southampton, UK) - Online

Venue: R&D Seminar Hall 2, **Topic:** Programmable Mechanical Metamaterials

Meeting Link click here : **Meeting ID:** 419 200 375 257, **Passcode:** 9rYPzo

7th Session: 03:15 PM to 04:00 PM

Session 7A: (Track 1A) Session Chair: Dr. Anil Kumar Venue: R&D Seminar Hall 1	Session 7B: (Track 1B) Session Chair: Dr. Anil Chandra Mahto Venue: R&D Seminar Hall 2	Session 7C: (Track 1A) Session Chair: Dr. Partha Mondal Venue: T&P Seminar Room (Online)
<ol style="list-style-type: none">1. Visualizing the Bubble Behavior during Pool Boiling on a Rough Vertical tube: A Comprehensive Experimental study.2. Analysis of ignition delay period by using Arrhenius Equation for a dual fuel diesel engine using hydrogen as a secondary fuel.3. Static analysis at active contact surface of orbit motor for contact stress and deformation.	<ol style="list-style-type: none">1. Bond graph modelling and dynamic analysis of an Accumulator Based Hybrid Power Transmission for wind turbine.2. Constitutive modeling for understanding stress-stretch behavior of Lennard-Jones non-crystalline molecular Solid.3. Strategic Selection of Metal-Cutting Processes for Thick Steel Plates: A Hybrid MOORA-PSI Approach	<ol style="list-style-type: none">1. Numerical Studies of Solid Rocket Propellant PMMA-PBAN-ALF3-Nitrocellulose-Difluoramine.2. Comparative Study on DI Diesel Engine Performance and Emissions using HCP microalgae biodiesel, Mouha oil biodiesel, Rubber seed oil biodiesel and Petroleum diesel.3. The effect of different subgrid-scale models on the flow field in cyclone separator using large-eddy simulations: A benchmark study.

Tea Break: 04:00 PM to 04:15 PM

Meeting Link for Session 7C click here : **Meeting ID:** 419 200 375 257, **Passcode:** 9rYPzo

DAY 2: 05.04.2024

Offline Training session by **ANSYS**: 04:15 PM to 05:00 PM

Venue: R&D Seminar Hall 2, **Topic**: Optimization using Ansys CFD – Parametrization, DoE, Adjoint, ROM

Valedictory Session: 05:00 PM to 05:30 PM

Venue: R&D Seminar Hall 2

Welcome to Dias by Prof. Arbind Kumar Department of Mechanical Engineering, BIT Mesra	05:00 PM to 05:05 PM
Concluding Speech by Chief Convenor, Prof. Anil Kumar Delhi Technical University, New Delhi	05:05 PM to 05:15 PM
Best Paper Award (Sponsored by COMSOL)	05:15 PM to 05:20 PM
Vote of Thanks by Organising Secretary and Convener	05:20 PM to 05:25 PM
National Anthem	05:25 PM to 05:30 PM

END OF DAY 2 and ICTFSD 2024 with HIGH TEA