

1. Record Nr.	UNINA9910799239003321
Titolo	Fluid Mechanics and Fluid Power, Volume 1 : Select Proceedings of FMFP 2022 // edited by Krishna Mohan Singh, Sushanta Dutta, Sudhakar Subudhi, Nikhil Kumar Singh
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	981-9978-27-0
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (XIII, 865 p. 581 illus., 489 illus. in color.)
Collana	Lecture Notes in Mechanical Engineering, , 2195-4364
Disciplina	910.5
Soggetti	Fluid mechanics Electric power production Mechanics, Applied Engineering Fluid Dynamics Mechanical Power Engineering Engineering Mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Contents -- About the Editors -- Fluid Flow and Heat Transfer -- Experimental Modelling to Measure the Seat Leakage in Shutdown System of PFBR -- 1 Introduction -- 2 Dimensional Analysis and Similarity Criteria -- 3 Description of Experimental Model and Methodology -- 4 Results and Discussions -- 5 Conclusion -- References -- Performance of Water-Based Loop Heat Pipe at Different Ambient Conditions for Thermal Management in Terrestrial Applications -- 1 Introduction -- 2 Literature Review and Objective -- 3 Mathematical Modeling of Loop Heat Pipe -- 3.1 Algorithm of Mathematical Modeling -- 4 Results and Discussion -- 4.1 Validation of Two-Phase Model -- 4.2 Effect of Ambient Condition on LHP -- 5 Conclusions -- References -- Investigation of Inlet Blockage in the Central Subassembly of a Sodium-Cooled Fast Reactor -- 1 Introduction -- 2 Literature Review and Objective -- 3 Modeling -- 4 Results and Discussion -- 4.1 Validation -- 4.2 Analysis of Rapid Inlet Blockage -- 5 Conclusions -- References -- Experimental Investigation of PHP with Hybrid Nanofluid for EV Battery Thermal

Management -- 1 Introduction -- 2 Materials and Methods -- 3 Results and Discussion -- 3.1 Start-Up of PHP -- 3.2 Effect of Working Fluid on the PHP Performance -- 4 Conclusions -- References -- Numerical Study of SiO<sub>2</sub>-Water Nanofluid Jet Impingement on Heated Surface -- 1 Introduction -- 2 Problem Statement -- 3 Fluid Properties -- 4 Different Zones Related to Jet Impingement -- 5 Mathematical Modelling -- 6 Grid Sensitivity Test -- 7 Results and Discussion -- 7.1 Effect of Particle Volume Fraction -- 7.2 Effect of Separation Distance (S/L) -- 8 Conclusion -- References -- An Updated Review of Heat Transfer Enhancement Techniques in Tube-Type Heat Exchangers -- 1 Introduction -- 2 Literature Review and Objective -- 3 Methods. 3.1 Classification of Passive Methods -- 4 Conclusions -- References -- Effect of Housing Design Modifications on Fluid Flow and Heat Transfer Characteristics of Electrical Motor Casing: A Numerical Study -- 1 Introduction -- 2 Literature Review and Objective -- 3 Numerical Procedure -- 3.1 Geometry -- 3.2 Computational Domain and Boundary Conditions -- 3.3 Numerical Modelling -- 3.4 Validation -- 4 Results and discussion -- 4.1 Effect of Fillet -- 4.2 Effect of Fillet Angles -- 4.3 Effect of Addition of Thin Strip (Design 3) -- 5 Conclusion -- References -- A Numerical Investigation for Heat Transfer Enhancement Using Convergent and Divergent Shape Orifice Geometry of Synthetic Jet -- 1 Introduction -- 2 Literature Review and Objective -- 3 Numerical Modelling -- 3.1 Geometry and Mesh -- 3.2 Fluent Parameters -- 3.3 Diaphragm Boundary Conditions -- 3.4 Validation of Numerical Results -- 3.5 Numerical Steps Involved -- 4 Results and Discussions -- 4.1 Flow Measurement -- 4.2 Heat Transfer Results -- 5 Conclusion -- References -- Performance Evaluation of a Thermal Energy Storage System with Stainless Steel Encapsulated Phase Change Material -- 1 Introduction -- 2 Literature Review and Objective -- 3 Materials and Methodology -- 3.1 Uncertainty Analysis -- 4 Results and Discussion -- 4.1 Liquefaction Fraction of PCM -- 4.2 Temperature Profile -- 4.3 Storage Analysis of the System -- 4.4 Stratification Analysis -- 5 Conclusion -- References -- Understanding the Heat Transfer Characteristics and Axis Switching Phenomenon in High Aspect Ratio Elliptical Orifice Impinging Synthetic Jets -- 1 Introduction -- 2 Literature Review and Objective -- 3 Materials and Methods -- 3.1 Data Reduction -- 4 Results and Discussion -- 4.1 Validation Study -- 4.2 Effect of AR on Local and Average Nu -- 4.3 Axis Switching -- 5 Conclusion -- References. Numerical Investigation of Exergy and Entropy Analysis for W/EG-Based Non-newtonian Hybrid Nanofluid for Helically Corrugated Tube Heat Exchanger -- 1 Introduction -- 2 Literature Review and Objective -- 3 Materials and Methods -- 3.1 Governing Equations -- 3.2 Grid Independence Test -- 4 Results and Discussion -- 4.1 Rate of Entropy Generation -- 4.2 Second Law Efficiency -- 5 Conclusion -- References -- Experimental and Numerical Investigation of a Device for Localized Cooling -- 1 Introduction -- 2 Methodology -- 3 Design Aspects -- 4 Results -- 4.1 Maximum Velocity Decay -- 4.2 Mean Velocity Profiles and Contours -- 4.3 Growth of Half Width -- 4.4 Temperature Distribution -- 5 Conclusion -- References -- Study of MHD Stagnation Point Flow of Casson Fluid with Non-linear Radiation and Non-uniform Heat Source -- 1 Introduction -- 2 Mathematical Formulation -- 3 Solution of the Problem by HAM Method -- 3.1 The Skin-Friction, Sherwood Number and Nusselt Number -- 3.2 Convergence Analysis -- 4 Results and Discussion -- 5 Conclusion -- References -- Heat Transfer Enhancement Using Passive Technique -- 1 Introduction -- 2 Literature Review and Objective -- 3 Materials and Methods -- 4 Results and Discussion -- 5 Conclusions -- References -- A Review

on Heat Pipe-Assisted Thermal Management Systems in Electrical Vehicles for Lithium-Ion Batteries -- 1 Introduction -- 2 Literature Review -- 2.1 Heat Pipe-Assisted BTMS -- 2.2 Oscillating Heat Pipe (OHP) Assisted BTMS -- 2.3 Heat Pipe-Phase Change Materials (HP-PCM) Assisted BTMS -- 3 Discussions -- 4 Concluding Remarks -- Appendix 1: Summary of some relevant studies on Heat pipe-based BTMS -- Appendix 2: Summary of some relevant studies on heat pipe and PCM-based BTMSs -- References -- Design to Avoid Dry Out in a Flat Heat Pipe Based on Cu Foam -- 1 Introduction -- 2 Methodology.

3 Results and Discussion -- 4 Conclusions -- References -- Framework with Data-Analytic for Fault Detection and Performance Prediction of a Steam Boiler: A Case Study -- 1 Introduction -- 2 Literature Review and Objective -- 3 Methodology -- 4 Results and Discussion -- 4.1 System Identification and Monitoring -- 4.2 Monitoring Through Fault Introduction -- 5 Conclusion -- References -- Design of Liquid Cooled Pin-Fin Heat Sink for High Voltage Electric Vehicle -- 1 Introduction -- 2 Methodology -- 3 Design of Heat Sink -- 4 CFD Analysis of Designed Heat Sink -- 4.1 Meshing -- 4.2 Boundary Conditions -- 4.3 Analysis Setup -- 5 Results and Discussion -- 5.1 Initial Geometry Results -- 5.2 Results by Changing Size and Spacing of Pins -- 5.3 Effect of Changing Number of Pins -- 5.4 One Inlet and One Outlet with Compartment Structure -- 5.5 Reducing Thickness of Heat Sink -- 5.6 Changing Mass Flow Rate -- 6 Conclusions -- References -- Establishment of Thermal Mixing Behavior in Grid Plate of FBRs 1 & 2 -- 1 Introduction -- 2 Methodology -- 2.1 Physical Modeling and Meshing -- 2.2 Computational Methodology -- 3 Results and Discussions -- 4 Conclusion -- References -- Velocity Slip and Temperature Jump in Homogeneous and Heterogeneous Porous Medium -- 1 Introduction -- 2 Mathematical Formulation -- 3 Theoretical Analysis -- 3.1 Case I: Homogenous Porous Medium -- 3.2 Case II: Heterogeneous Porous Medium -- 4 Results and Discussion -- 5 Conclusion -- References -- Insights from a Nonlinear and Corresponding Linear Model of a Pulsating Heat Pipe -- 1 Introduction -- 2 Mathematical Modeling -- 2.1 Nonlinear System -- 2.2 Linear System -- 3 Results and Discussion -- 3.1 Phase-Portrait -- 3.2 Hidden Attractor -- 3.3 Phase-Portrait of the Hidden Attractor -- 4 Conclusion -- References.

Heat Transfer Evaluation Method for RC Members at Standard Fire Scenario -- 1 Introduction -- 2 Literature Review and Objective -- 3 Heat Transfer Model -- 3.1 Internal Elements -- 3.2 External and Corner Elements -- 4 Heat Transfer Evaluation -- 4.1 Case Study I: 1D Heat Transfer Analysis of Shear Walls Exposed to ISO 834 Fire from One Side -- 4.2 Case Study II: 2D Heat Transfer Analysis of RC Column Exposed to ASTM Fire from Four Side -- 5 Conclusions -- References -- Enhanced Melting Behavior of Phase Change Material (PCM) in a Rectangular Cavity: Effect of Fin -- 1 Introduction -- 2 Numerical Modeling -- 2.1 Physical Model -- 2.2 Mathematical Description -- 3 Numerical Method -- 4 Results and Discussion -- 4.1 Validation Study -- 4.2 Effect of Fin Surface Area -- 4.3 Effect of Number of Fins -- 5 Conclusions -- References -- Determining the Best Passive Heat Transfer Enhancement Technique in Circular Pipe Heat Exchangers with the MCDM Technique -- 1 Introduction -- 2 Literature Review and Objective -- 3 Materials and Methods -- 3.1 Correlation Analysis -- 3.2 Anova -- 3.3 Multiple-criteria Decision-Making (MCDM) -- 3.4 Sensitivity Analysis -- 4 Results and Discussion -- 4.1 Correlation Analysis -- 4.2 Anova -- 4.3 Topsis -- 4.4 Sensitivity Analysis -- 5 Conclusions -- References -- Thermo-

Diffusion and Heat Generation Effects on Unsteady MHD Flow of Nanofluid in a Perforated Vertical Medium -- 1 Introduction -- 2 Mathematical Formulation of the Problem -- 3 Solution of the Problem -- 3.1 Solution of Temperature Profiles -- 3.2 Solution of Concentration Profiles -- 3.3 Solution of Velocity Profiles -- 4 Result and Discussion -- 5 Conclusions -- References -- Critical Thickness of the Phase Change Material (RT-42) for Temperature Management of 18,650 Li-Ion Cell Undergoing Rapid Discharging -- 1 Introduction -- 2 The Test Rig. 3 The Numerical Model.

---

Sommario/riassunto

This book comprises select peer-reviewed proceedings of the 9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP 2022). This book brings together scientific ideas and engineering solutions put forth by researchers and practitioners from academia and industry in the important and ubiquitous field of fluid mechanics. The contents of this book focus on fundamental issues and perspective in fluid mechanics, measurement techniques in fluid mechanics, computational fluid and gas dynamics, instability, transition and turbulence, fluid-structure interaction, multiphase flows, microfluidics, bio-inspired fluid mechanics, aerodynamics, turbomachinery, propulsion and power and other miscellaneous topics in the broad domain of fluid mechanics. This book is a useful reference to researchers and professionals working in the broad field of mechanics.

---