Profile Page

Name	:	Dr Rajan Kumar
Designation	:	Assistant Professor Grade-i
Department	:	Mechanical Engineering
Qualification	:	Ph.D. Mechanical Engineering (Thermal Engineering) (IIT Mandi) M.Tech. Mechanical Engineering (Thermal Engineering) (NIT Jalandhar) B.Tech. Mechanical Engineering (HPU Shimla)
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Research Interests :

Microfluidics, Nanofluidics, Convective Heat Transfer, Computational Fluid Dynamics, MEMS Design and Microchannel Heat Sink, Optimization of Thermal Devices and Energy Management, Nanofluids and Nano-Enhanced Phase Change Materials in PV/T system, Battery Thermal Management System

Other Profile Links :

Google Scholar Link :

Google Scholar Click Here

Personal Web Link :

ResearchGate Click Here

Journal Publications :

Year	Journal	Publication
2023	Journal of Power Sources, 555, 232351	Abhijeet Mitra, Rajan Kumar, Dwesh K Singh, Thermal management of lithium-ion batteries using carbon-based nanofluid flowing through different flow channel configurations
2023	Energy, 263, 125701	Aditya Kumar Singh, Pushpendra Kumar Singh Rathore, RK Sharma, Naveen Kumar Gupta, Rajan Kumar,Experimental evaluation of composite concrete incorporated with thermal energy storage material for improved thermal behavior of buildings
2022	Kuwait Journal of Science, 49, 1-16	Manpreet Kaur, Jyoti Bharj, Rabinder Singh Bharj, Rajan Kumar, Numerical modelling of non-premixed biogas and LPG combustion to study carbon nanostructures formation in flame

2022	International Journal of Green Energy, 20, 1-14	Vipul Deshmukh, Rajan Kumar, Praveen Kumar Tyagi, Performance enhancement of the photovoltaic module using a semicircular serpentine channel with binary fluids mixture
2022	Journal of Energy Storage, 48, 104059	Rajan Kumar, Abhijeet Mitra, Tangellapalli Srinivas, Role of nano-additives in the thermal management of lithium-ion batteries: A review
2022	International Communications in Heat and Mass Transfer, 139, 106443	Krishan Kumar, Rajan Kumar, Rabinder Singh Bharj, Effect of channel miniaturization on entropy generation in hybrid corrugation configuration channel
2022	International Communications in Heat and Mass Transfer, 138, 106335	Krishan Kumar, Rajan Kumar, Rabinder Singh Bharj, Zafar Said, Effect of arc corrugation initiation on the thermo-hydraulic performance and entropy generation of the corrugated tube
2022	Journal of Energy Storage, 53, 105195	Abhijeet Mitra, Rajan Kumar, Dwesh Kumar Singh, Zafar Said, Advances in the improvement of thermal-conductivity of phase change material-based lithium-ion battery thermal management systems: An updated review
2022	Energy Technology	Suraj Rana, Rajan Kumar, Rabinder Singh Bharj, Lithium?ion battery thermal management techniques and their current readiness level
2022	Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science,	Abhinav Sohal, Krishan Kumar, Rajan Kumar, Heat transfer enhancement with channel surface roughness: A comprehensive review
2022	Working with Older People, 26, 319-324	Rajan Kumar, COVID-19 Outbreak in India: Age-Wise Analysis of Patients
2022	International Communications in Heat and Mass Transfer 134, 105999	Krishan Kumar, Rajan Kumar, RS Bharj, Thermohydraulic performance enhancement using novel hybrid corrugation configuration channels in thermal systems
2021	Journal of the Brazilian Society of Mechanical Sciences and Engineering, 43, 1-17	Dwesh K Singh, Waquar Ahmad, Rajan Kumar, Two phase nanofluid flow and heat transfer characteristics in smooth horizontal tube installed by twisted tapes with alternate axes of rotation
2021	The Open COVID Journal, 1, 191-195	Rajan Kumar, COVID-19 Outbreak in India: A Review of Preventive Measures and Challenges during the First Wave
2021	Energy Technology, 9, 2100619	Praveen Kumar Tyagi, Rajan Kumar, Emerging Trends on the Implementation of Nanomaterials for Improving the Performance of Photovoltaic Thermal Systems: Energetic, Exergetic, Environmental, and Economic Perspectives
2021	Nano Energy, 93, 106834	Praveen Kumar Tyagi, Rajan Kumar, Zafar Said, Recent advances on the role of nanomaterials for improving the performance of photovoltaic thermal systems: Trends, challenges and prospective
2021	Fuel, 292, 120346	Sarthak Baweja, Ajay Trehan, Rajan Kumar, Combustion, performance, and emission analysis of a CI engine fueled with mustard oil biodiesel blended in diesel fuel
2021	The European Physical Journal Plus, 136 Issue 4 Pages 1-40	Krishan Kumar, Rajan Kumar, Rabinder Singh Bharj, Pranab Kumar Mondal, Irreversibility analysis of the convective flow through corrugated channels: a comprehensive review
2021	Diabetes & Metabolic Syndrome, Volume 15, Issue 3, May–June 2021, Pages 1049-1050	Rajan Kumar, Karan Veer, How artificial intelligence and internet of things can aid in the distribution of COVID-19 vaccines
2021	Facta Universitatis, Series: Mechanical Engineering, 20, 503-518	Krishan Kumar, Prathvi Raj Chauhan, Rajan Kumar, Rabinder Singh Bharj, Irreversibility analysis in Al2O3-water nanofluid flow with variable property
2021	Journal of Thermal Engineering (Accepted)	Rajan Kumar, A Critical re-examination of Reynolds Analogy for micro-convective flow

2020	Physics of Fluids 32(12) 121301 (Recognition: Editor's pick)	Praveen Kumar Tyagi, Rajan Kumar, Pranab Kumar Mondal, A review of the state-of-the-art nanofluid spray and jet impingement cooling
2020	Iranian Journal of Science and Technology: Transactions of Mechanical Engineering	Rajan Kumar, S.P. Mahulikar, Effect of Density Variation on Rarefied and Non-rarefied Gaseous Flows in Developing Region of Microtubes
2020	International Journal of Exergy, Vol. 31, No. 1	K. Kumar, R. Kumar, R. S. Bharj, Entropy generation analysis due to heat transfer and nanofluid flow through microchannels: a review
2020	International Journal of Energy Research, Vol. 44, Issue 8, Pages 6149-6169	Rajan Kumar, Vipul Deshmukh, Rabinder Singh Bharj, Performance enhancement of photovoltaic modules by nanofluid cooling: A comprehensive review
2020	Journal of Non-Equilibrium Thermodynamics, 45, Issue 4, 333–342	Krishan Kumar, Rajan Kumar and Rabinder Singh Bharj, Circular Microchannel Heat Sink Optimization Using Entropy Generation Minimization Method
2020	Journal of Non-Equilibrium Thermodynamics (De Gruyter) 45(1): 1–17	Prathvi Raj Chauhan, Krishan Kumar, Rajan Kumar, Mohammad Rahimi-Gorji, Rabinder Singh Bharj, Effect of Thermophysical Property Variation on Entropy Generation towards Micro-Scale
2020	Journal of Mechanical Engineering (JMechE), Vol 17(1), 49-62	Design and development of the front wheel hub for all-terrain vehicle (ATV)
2020	Journal of Energy Storage 32, 101876	Rajan Kumar, Paidi Praveen, Samikhshak Gupta, Juttu Saikiran, Rabinder SinghBharj, Performance evaluation of photovoltaic module integrated with phase change material-filled container with external fins for extremely hot climates
2019	Journal of Thermal Analysis and Calorimetry, 140, 1919–1934	Rajan Kumar, Shripad P. Mahulikar, Heat transfer characteristics of water flowing through micro-tube heat exchanger with variable fluid properties
2019	Journal of Thermal Engineering (in press)	R. Kumar, Physical effects of variable fluid properties on gaseous slip-flow through a micro-channel heat sink
2019	Journal of Mechanical Engineering, Vol 16(2), 41-52, 2019	G.N. Singh, R. S. Bharj, R. Kumar, Numerical investigation on performance and emission characteristics of a diesel engine fired with methanol blended diesel fuel
2019	Thermal Science and Engineering Progress, (Elsevier) Vol. 13, 100365-1-10	P.R. Chauhan, R. Kumar, R.S. Bharj, Optimization of the circular microchannel heat sink under viscous heating effect using entropy generation minimization method
2018	Annales de Chimie. Science des Materiaux, Vol. 42, No. 3, pp. 363-385	P.R. Chauhan, R. Kumar, A comprehensive review on heat transfer enhancement and pressure drop characteristics of nanofluid flow through micro-channels
2018	Heat Transfer Engineering (Taylor and Francis) Vol. 39, No. 4, pp. 374-390	R. Kumar, S.P. Mahulikar, Physical effects of variable thermophysical fluid properties on flow and thermal development in micro-channel
2018	Journal of Engineering Thermophysics, Vol. 27, No. 4, pp 456–473	R. Kumar, S.P. Mahulikar, Variable fluid property effect on heat transfer and frictional flow characteristics of water flowing through microchannel
2017	Journal of Heat Transfer, Transactions of the ASME, Vol. 139, No. 7, pp. 071701-1–10	R. Kumar, S.P. Mahulikar, Numerical reexamination of Chilton-Colburn Analogy for thermophysical fluid properties
2017	Heat Transfer - Asian Research (Wiley Periodicals, Inc.) Vol. 46, No. 7, pp. 1029–1040	R. Kumar, S.P. Mahulikar, Physical effects of variable fluid properties on laminar gas-microconvective flow
2015	International Journal of Thermal Sciences (Elsevier) Vol. 98, pp. 179–191	R. Kumar, S.P. Mahulikar, Effect of temperature-dependent viscosity variation on fully developed laminar microconvective flow

2015	Fluid Dynamics Research (IOP Publishing) Vol. 47, No. 6, pp. 065501-1–21	R. Kumar, S.P. Mahulikar, Frictional flow characteristics of microconvective flow for variable fluid properties

Conference Publications :

Year	Conference	Publication
2021	International Conference on Materials, Reliability, Safety and Environmental Issues (IMRSE 2021) during June 25-27th, 2021 at Dr. B R Ambedkar National Institute of Technology, Jalandhar Punjab.	Performance enhancement of PVT system by using methanol/water binary fluid
2021	Khazar 2nd International Conference on Scientific Research	Krishan Kumar, Rajan Kumar, Rabinder Singh Bharj, Exergetic analysis of microchannel with sinusoidal corrugations
2018	19th ISME Conference on Advances in Mechanical Engineering (Mechanical Systems and Sustainability)	Prathvi Raj Chauhan, Rajan Kumar, Krishan Kumar, Heat transfer and pressure drop characteristics of water flowing through rectangular microchannels

Book/Chapter Publications :

Type	Title	Publisher	Authors	ISBN/ISSN No.	Year
Book	Nanotechnology applications in green energy systems	Nova Science Publishers, Inc.	Editors: T. Srinivas and Rajan Kumar	978-1-68507-451-7	2022
Chapter	Solar-Based Electric Vehicle Charging Stations in India: A Perspective	Springer Singapore	Rajan Kumar, Rabinder Singh Bharj, Jyoti Bharj, Gurkamal Nain Singh, Monia Sharma	978-981-16-0593-2	2021
Chapter	Efficiency Improvement of Internal Combustion Engines Over Time	Springer, Singapore	Sarthak Baweja, Rajan Kumar	978-981-16-1581-8	2021
Chapter	Effect of Dust Accumulation on the Power Production of the PV Module at Different Heights: A Case Study	Springer, Cham	Rajan Kumar, Sachin Sharma, Akshu Gupta, Indar Singh, Paras Chaudhary, Sumit Kumar, Rabinder Singh Bharj	978-3-030-84634-3	2021
Chapter	Agricultural Waste Derived 2nd Generation Ethanol Blended Diesel Fuel in India: A Perspective	Springer, Singapore	Rabinder Singh Bharj, Gurkamal Nain Singh, Rajan Kumar	978-981-15-0417-4	2020
Chapter	On-Board Post-Combustion Emission Control Strategies for Diesel Engine in India to Meet Bharat Stage VI Norms	Springer, Singapore	Rabinder Singh Bharj, Rajan Kumar, Gurkamal Nain Singh	978-981-13-3275-3	2018

Research Projects :

Role	Project Type	Title	Funding Agency	From	To	Amount	Status	Co-Investigator
Co-PI	Minor Project	Experimental study of thermal performance based thermal comfort assessment of a novel solar air heater with semicircular glass cover and super hydrophobic absorber plate for western Himalayan region in India	TEQIP-III	Dec 2018	Dec 2019	3 Lakhs	Onging	Dr. Satyender Singh and Dr. Sanjay
Co-PI	External	Concentrated solar air heater with passive tracking mechanism and Corrugated receiver	DST	2021	2023	1842141	Ongoing	Dr Srinivas Tangellapalli

Events Organized :

Category	Type	Title	Venue	From	To	Designation
e-STC	International	Multi-Scale Computational Fluid Dynamics: Fundamentals and Applications	Dr. B R Ambedkar NIT Jalandhar	21/09/2020	25/09/2020	Coordinator

Professional Affiliations :

Designation	Organization
Reviewer	Physics of Fluids
Reviewer	International Journal of Thermal Sciences
Reviewer	Aerospace Science and Technology
Reviewer	Journal of Thermal Engineering
Reviewer	Journal of the Brazilian Society of Mechanical Sciences and Engineering
Academic expert member	Board of Study (BOS) Committee for Mechanical Engineering batch 2019 at INDUS INTERNATIONAL UNIVERSITY Una
Editorial board member	International Journal of Mechanical Engineering and Applications

Reviewer	Journal of Thermal Analysis and Calorimetry

PhD Supervised :

Scholar Name	Research Topic	Status	Year	Co-Supervisor
Suraj Rana	BTMS	Ongoing	2022	Dr. R S Bharj
Praveen Kumar Tyagi	Spray Cooling	Ongoing	2019	
Krishan Kumar	Microscale Fluid Flow and Heat Transfer	Ongoing	2018	Dr. R S Bharj

PG Dissertation Guided :

Student Name	Dissertation Title	Status	Year	Co-Supervisor
Abhijeet Mitra	Thermal management of lithium-ion batteries using carbon-based nanofluid flowing through serpentine channel	Completed	2022	Dr. Dwesh
Hubban Zahid	Effect of MWCNT-based nanofluid flowing through a distributed channel on the thermal management of lithium-ion battery pack	Completed	2022	Dr. Satyender Singh
Ravi Ranjan	BTMS	Ongoing	2022	Dr. T. Srinivas
Abhinav Sohal	Thermo-hydraulic performance of different fluids flowing through a corrugated channel	Completed	2021	
Gaurav Arora	Performance enhancement of PVT system by using methanol-water and acetone-water binary fluid mixture	Completed (Currently PhD scholar at IIT Delhi)	2021	
Vipul Deshmukh	Performance enhancement of photovoltaic module by binary fluid and nanofluid	Completed	2020	
Prathvi Raj Chauhan	Analysis of entropy generation in laminar micro-convective fluid flow	Completed (Currently PhD scholar at IIT Delhi)	2019	Dr. RS Bharj
Sarthak Baweja	Combustion and performance investigation on single cylinder 4 stroke CI Engines fuelled with Mustard Oil Biodiesel and Diesel.	Completed	2019	Mr. Ajay Trehan

Patents :

Name	Reg./Ref. No.	Date of Award/Filling	Organization	Status
Hybrid Corrugation Configuration Channel	332251-001	17-03-2021	Govt. of India, The Patent Office	Published

Admin. Responsiblities :

Position Held	Organization	From	To
Member	Biogas plant installation committee in Mega Hostel	01-03-2019	Till Date
Coordinator	Transportation and Institute Vehicle	02-03-2021	Till Date
External Expert Member	BOS for the department of Mechanical Engineering of Indus International University	27-05-2019	Till Date

Faculty Mentor	Departmental Student Club-Spark X	2019	Till date
Convener	BTech final year project monitoring and evaluation committee	2018	Till date
Coordinator	Departmental Time-Table	2020	Till Date
Member	Departmental-Alumni Affairs Committee	2019	2020
Member	NBA core committee	2019	2020
Faculty-in-charge	Heat Engine Laboratory	2018	Till Date
Batch coordinator	MTech (2017-2019)	2018	2019

Award and Honours :

Title	**Activity**	**Given by**	**Year**
Mukhiya Mantri Protsahan Yojna (One-time Incentive).		Govt. of Himachal Pradesh (State Sponsored Schemes)	2014