KL (DEEMED TO BE UNIVERSITY)

CATEGORY 1 UNIVERSITY BY MHRD, Govt. of India

KL ACCREDITED BY NAAC WITH A++ GRADE

nirf 2024 NATIONAL INSTITUTIONAL RANKING FRAMEWORK RANKED 22 AMONG ALL UNIVERSITIES

45 YEARS OF EDUCATIONAL LEADERSHIP

DEPARTMENT OF MECHANICAL ENGINEERING

THERMAL ENGINEERING RESEARCH CENTRE

THERMAL ENGINEERING RESEARCH CENTRE

About the research centre

The Thermal Engineering Research Lab focuses on energy systems, phase change materials, and thermal management solutions for emerging technologies. Research areas include solar energy optimization, thermal stability, and eco-friendly cooling systems. Projects involve innovative designs for hybrid thermal management systems in electric vehicles and advanced solar stills for water purification. The lab's facilities include high-precision thermal analyzers and material testing tools. Faculty expertise spans thermodynamics, heat transfer, and renewable energy systems, ensuring impactful contributions. The lab emphasizes sustainable practices, conducting interdisciplinary research that addresses global energy challenges. Training programs and workshops provide students with hands-on experience in thermal engineering. The center's mission is to advance the field of thermal sciences through innovative research, industry collaboration, and practical solutions.

Vision:

To be a leading center of excellence in advanced thermal systems and fostering innovation that address real-world energy challenges.

Mission:

1. Advance research and innovation in the field of thermal sciences by developing efficient, sustainable, and cutting-edge technologies.
2. The lab focuses on solving real-world thermal challenges, promoting interdisciplinary collaboration, and contributing to the education and training of future engineers and researchers.

Objectives

- Publish high-quality research papers and technical articles on thermal management materials and processes in leading journals.
- Innovate new thermal management materials that enhance heat dissipation, energy conservation, and overall system performance.
- Create specialized educational programs and workshops to train the next generation of thermal engineers and scientists.
- Play a leading role in driving sustainable development through advancements in thermal technology, contributing to long-term global sustainability efforts.

KEY RESEARCH AREAS

Energy Engineering	Computational Fluid Dynamics (CFD)
Advanced Energy Storage Systems	Turbulence Modeling and Simulation
Renewable Energy Integration and Smart Grids	Multiphase Flow Dynamics
Energy Efficiency in Buildings and HVAC Systems	CFD for Renewable Energy Systems
Carbon Capture, Utilization, and Storage (CCUS)	CFD for Biological and Biomedical Applications
Hydrogen Economy and Fuel Cell Technologies	CFD for Urban and Environmental Applications
Solar Energy Conversion and Photovoltaics	Heat Transfer and Fluid Flow in Micro and Nano-Scale Systems
Thermochemical Energy Storage	

EQUIPMENT DETAILS

SOLAR POWER METER (Model: TES 1333)

ANEMOMETER

DATA LOGGER

VAPOUR COMPRESSION REFERGRATION SYSTEM

RECIRCULATING AIR CONDESTIONER TEST RIG

OUR TEAM

Dr. K. Ramakrishna
Professor & Dean Quality

Dr. K. V. Narasimha Rao
Professor & associate dean Quality

Dr. G. Murali
Professor
Energy & CFD Group Head

Dr. V. L. Mangesh
Professor

Dr. Athul Bhattad
Associate Professor

Dr. Giphin George
Assistant Professor

Dr. Vinay Atgur
Assistant Professor

Dr. T. Kanthimathi
Assistant Professor

Dr. K. Sai Sarath
Assistant Professor

COLLABORATORS

Mohsen Sharifpur
Professor
Mechanical and Aeronautical Engineering,
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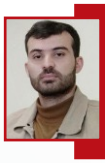
Sydney, Australia

Harez Rashid Ahmed
Lecturer
College of Science, Department of
Medical Laboratory Science, Komar University of
Science and Technology, 46001 Sulaimani, Iraq



Kawan F. Kayani
Researcher
Department of Chemistry, College of Science,
Charmo University, Peshawa Street,
Chamchamal, Sulaimani City 46023, Iraq

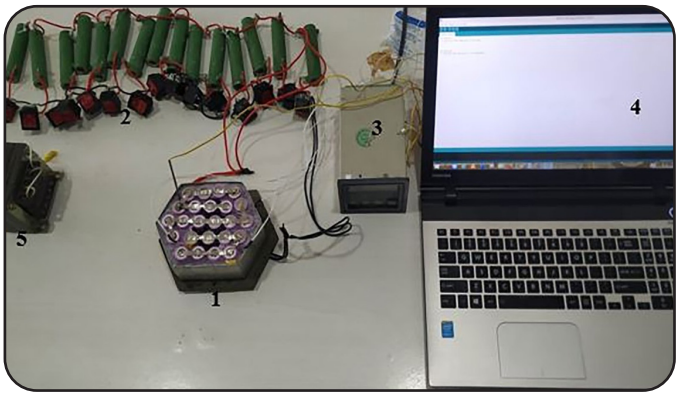
SCHOLARS INFORMATION

S.No	Scholar Name	Regd No	Supervisor Name	PT/FT
1	SURASE RAVINDRA SAHEBRAO	193070002	Dr. K. Rama Krishna	PT
2	Rakesh K	183070020	Dr. K. Rama Krishna	PT
3	P.Kiran kumar	2102070001	Dr. K. Rama Krishna	FT
4	GADIPELLY BHASKAR	173070036	Dr. K. V. Narasimha Rao	PT
5	Janumala Emeema	183070026	Dr. G. Murali	PT
6	D jyosthana	2102071002	Dr. G. Murali	PT
7	Varalakshmi penugonda	183070019	Dr. G. Murali	PT
8	P.Siva naga masthan vali	2102070003	Dr. G. Murali	FT
10	Maimuna siddiqui	2202072001	Dr.V.L.Mangesh	PT
11	Jai Ganesh R	2402530003	Dr.V.L.Mangesh	
12	Muthuluru rajesh	163070064	Dr.V.L.Mangesh	PT
13	NANDINI BONAM	2102071007	Dr.Giphin George	PT
14	Venkata Naga Murali krishna Sharma	2102071001	Dr.Giphin George	PT
15	KARUNA KANTH BATHULA	2312071001	Dr.Giphin George	PT
16	Ramgopal charyulu	2102071012	Dr.K.Sai sarath	PT
17	LAEEQ AHMED KHAN AQIL	2102071009	Dr. Atul Bhattad	PT

HIGHLIGHTS OF RESEARCH CENTRE WORKS

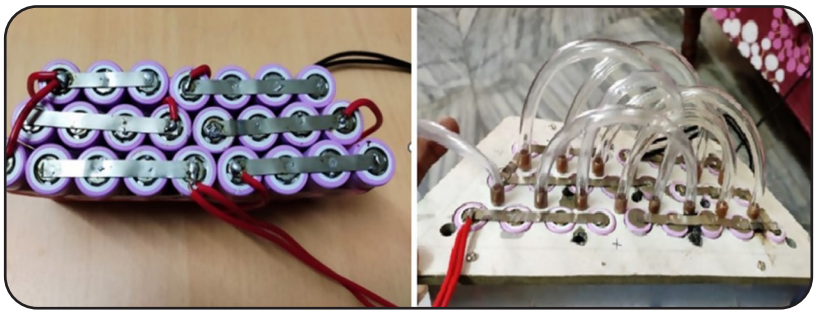
LIB module general experiment layout:

(1) resistors for discharging the test module,
(2) battery module, (3) peristaltic pump, and (4) PC



LIB module general experiment layout:

(1) battery module, (2) resistors for discharging the test module, (3) data logger, (4) PC, and (5) direct charger

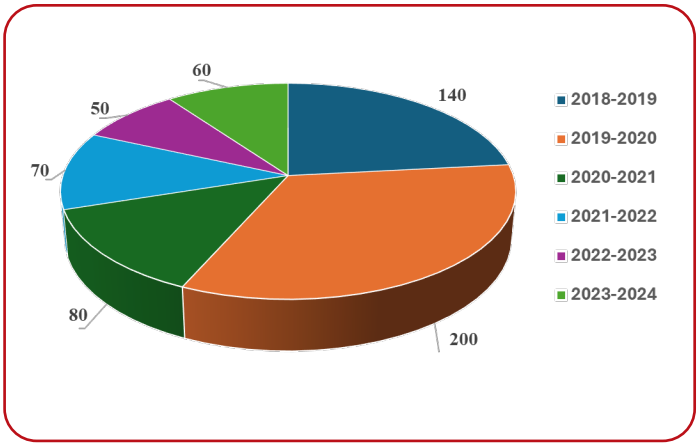


Trapezoidal battery design:

(a) a trapezoidal shaped battery pack and
(b) trapezoidal shaped battery pack with liquid cooing system

Arduino linked to a 100k thermistor and a solar still

PUBLICATION ANALYTICS



No. of Research Publications: 600

FUNDING PROJECT SCANCTIONED

Title: Hydroprocessing of waste plastics to produce diesel under low processing temperatures

Agency: SERB SURE Project: SUR/2022/002647

Dr.V.L.Mangesh (Principal Investigator)

Professor

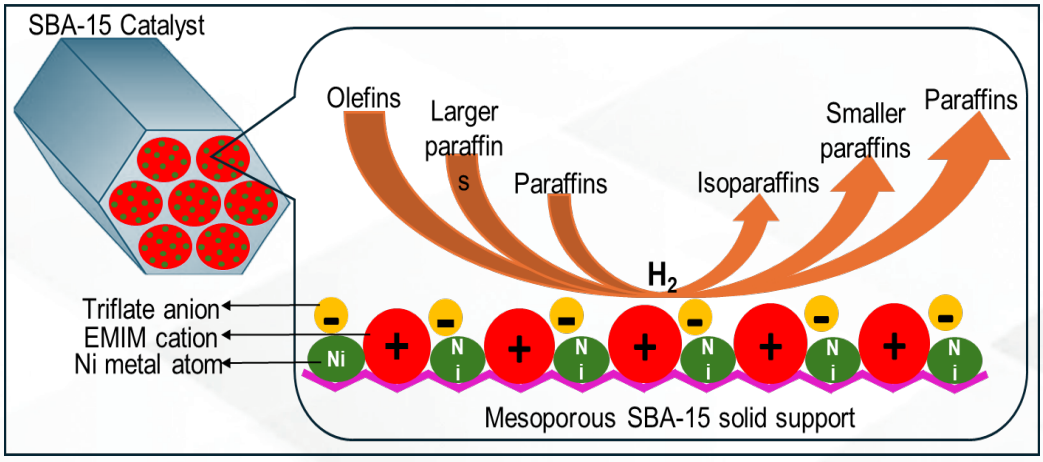
Dr.G.Murali (Co-Principal Investigator)

Professor

Sanctioned amount of Rupees 2116400/-

Objectives

1. Convert waste plastics pyrolysis oil (olefins, large n-paraffins) to diesel (aromatics, smaller n-paraffins and iso paraffins)
2. Utilize Ionic liquids supported on mesoporous materials as catalyst to achieve low reaction temperatures



COLLABORATIVE PUBLICATIONS

1) Murali G, Ramani P, Murugan M, Elumalai PV, Ranjan Goud NU, Prabhakar S., Improved solar still productivity using PCM and nano-PCM composites integerated energy storage. Scientific Reports. 2024 Jul 6;14(1):15609.

2) Janumala E, Govindarajan M, Reddi BV, Manickam M, Venkatesan EP, Saleel CA, Alwetaishi M, Shaik S, Nur-E-Alam M, Soudagar M., Exploring thermal dynamics of polyaniline-modified paraffin wax phase change material with varied PANI loadings (1–4% wt.). Heat and Mass Transfer. 2024 Jun;60(6):977-86.

3) Nagaraju V, Murali G, Bewoor AK, Kumar R, Sharifpur M, Assad M, Awad MM., Experimental study on performance of single slope solar still integrated with sand troughs. Sustainable Energy Technologies and Assessments. 2022 Mar 1;50:101884.

4) Kedar SA, Bewoor AK, Murali G, Kumar R, Sadeghzadeh M, Issakhov A, Effect of reflecting material on CPC to improve the performance of hybrid groundwater solar desalination system. International Journal of Photoenergy. 2021;2021(1):6675236.

5) Sujithraj A, Tamizhdurai P, Mangesh VL, Kavitha C, Subramani A, Saravanan P, Nisha P, Sasikumar P, Kumar NS, Alreshaidan SB, Almutairi G., Renewable energy from waste plastic: Hydroprocessing of mixed waste plastic to diesel fuel utilizing Fe/Mo-Al2O3 catalyst. Process Safety and Environmental Protection. 2025 Jan 1;193:683-95.

6) Tumuluri K, Abu-Dahrieh JK, Mathiyalagan K, Munusamy Kalidhas A, Perumal T, Srinivasan S, Mangesh VL, Siva Kumar N, Alreshaidan SB, Chandrasekaran K, Arunachalam V., Selective Oxidation of Cyclohexene over the Mesoporous H-Beta Zeolite on Copper/Nickel Bimetal Catalyst in Continuous Reactor. ACS Omega. 2024 Jun 6.

7) Mangesh VL, Tamizhdurai P, Vedavalli R, Santhosh S, Kumaran R, Kumar NS, Al-Fatesh AS, Basivi PK, Murali G, Maritime decarbonization: Alternate marine fuel from hydroprocessing of waste plastics. Fuel. 2024 Jun 1;365:131233.

8) Mangesh VL, Perumal T, Santhosh S, Kumar NS, Vijayaraj A, Kumar GS, Sugumaran S, Murali G, Basivi PK, Al-Fatesh AS, Sustainable biofuel synthesis from non-edible oils: a mesoporous ZSM-5/Ni/Pt catalyst approach. RSC advances. 2024;14(11):7728-39.

9) Mangesh VL, Govindarajan M, Chekuri RB, Perumal T, Rajendran K, Chandrasekaran K, Kumar NS, Basivi PK, Alreshaidan SB, Al-Fatesh AS, Ni–Fe bimetallic catalysts with high dispersion supported by SBA-15 evaluated for the selective oxidation of benzyl alcohol to benzaldehyde. RSC advances. 2024;14(4):2300-10.

10) Subramanian N, Perumal T, Mangesh VL, Chinnadurai R, Sakthinathan S, Chiu TW, Selvaraj M, Madhavan J., Future Perspectives on Zeolite/Graphene Oxide Composite Synthesis and Applications. Energy & Fuels. 2023 Oct 26;37(22):17013-51.

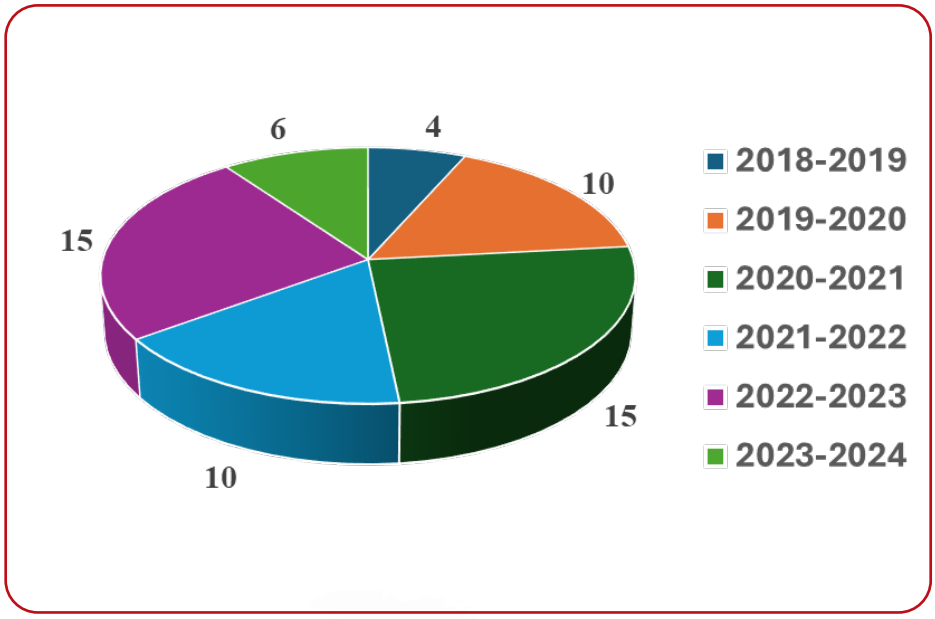
11) Rajesh M, Mangesh VL, Tamizhdurai P, Kumar NS, Vali SM, Subramani A, Prasath GS, Basivi PK, Al-Fatesh AS, Alreshaidan SB, Saravanan P, Zirconium supported on mesoporous KIT-6 by the catalytic activity of ethanol to 1, 3-butadiene. Advanced Powder Technology. 2024 Jun 1;35(6):104495.

12) Harez Rashid Ahmed, Kawan F Kayani, Anu Mary Ealias, Giphin George, “Biochar a an Eco-friendly Adsorbent for Ibuprofen Removal via Adsorption: A Review”, Inorganic Chemistry Communication, Volume 170, Part 2, December 2024, 113397.

13) Harez Rashid Ahmed, Kawan F Kayani, Anu Mary Ealias, Giphin George, “A Review of Bio Catalysis for the Removal of Diverse Dyes from Aqueous Solutions”, Inorganic Chemistry Communication, Volume 170, Part 3, December 2024, 113447.

PATENTS AWARDED & GRANTED

S.no	Title of Grant	Application No.	Year
1	SYSTEM FOR A HYDRAULIC ROVER MECHANISM	201841011806	2018
2	CATALYTIC CONVERTER RETROFIT WITH MONOLITH CANISTER CONTAINING CERIA AND ZIRCONIA CATALYST COATED CLAY MARBLES FOR USE IN DIESEL ENGINES	202041035317	2020



Total Patents Published: 60

CONSULTANCY

S.NO	Name ofthe consultant	Name of consultancy project	Nature of consultancy project	Consulting/Sponsoring agency with contact details	Date / duration	Revenue generated (amount in rupees)
1	Dr. G.Murali	Thermal Management of UPS EB Inverter using nano enhanced PCM	Industrial project	Bhass Engineering pvt ltd , Hosur	20-12-2021	50000
2	Dr. KV Narasimha Rao	Design of a Dryer using Heat Pump	Industrial project	Cleantech Consultants, Bangalore	15-12-2021	46000
3	Dr. K Ramakrishna	Validation of Duct design done for air-conditioning system for Commercial complex	Industrial project	Cleantech Consultants, Bangalore	15-12-2021	49000
4	Dr.Atul Bhattad	The influecnce of hybrid nano fluid on the performance parameter of plate heat exchanger	Industrial	R G Industries #13-52/44/1, Seetha nagaram Gunur Dt -522501 rgindustries26@gmail.com	05-05-2022	40000
5	Dr.G.Murali	A PCM integrated thermal energy storage in solar water heating	Research	Green valley Plains services trade. L.L.C,Postal code 130,Azaiba,Sultanate of Oman. Email:mctgreen@gmail.com	25-12-2022	50,000
6	Dr.K.V.Narasimma rao	Precooling and degreeing (ripening) of Mosambi and lemon fruits	Research project	Cleantech consultants, A,308, Block -II, KSSIDC COMPLEX, Bengalore	23-12-2022	46,600
7	Dr.K.Rama Krishna	Spray drying of vegetables - process design and equipment for tomato powder	Research project	Cleantech consultants, A,308, Block -II, KSSIDC COMPLEX, Bengalore	23-12-2022	47,700
8	Dr.V.L.Managesh	Design of Electrical Pyrolysis Muffle Furnace"	Research project	PLOT No:4 G2, Ranga Nagar, Moulivakkam, Chennai, Tamil Nadu 600125	18-01-2023	50,000
9	Dr K. Sai Sarath	Analysis of Heat Transfer during Machining Process	Consultancy	Seeram Innovations Pvt. Ltd, E2,Sun RiseTowers Appt, Kunchanapalli, Guntur District, AP 522301.	24-02-2023	12,500
10	Dr Giphin George	Feasibility study of installing a solar PV power plant	Consultancy	Seeram Innovations Pvt. Ltd., Sunrise Towers, Kunchanapalli, Guntur-522501	2022-23	20000
11	Dr.ATUL BHATTAD	"Evaluating the thermal conductivity through thermal conductivity device"	Consultancy	Rg industries, 13-52/44/1, Seethanagaram, Tadepalli, Guntur Dist-522501	21-03-2023	39500

TOP 10 PUBLICATIONS

S.No	Authors	Title of the Journal	Journal Impact factor
1	Murali G, Sravya GS, Jaya J, Vamsi VN.	A review on hybrid thermal management of battery packs and it's cooling performance by enhanced PCM. Renewable and Sustainable Energy Reviews. 2021 Oct 1;150:111513.	16.3
2	Tamizhdurai P, Mangesh VL, Santhosh S, Vedavalli R, Kavitha C, Bhutto JK, Alreshidi MA, Yadav KK, Kumaran R	A state-of-the-art review of multilayer packaging recycling: Challenges, alternatives, and outlook. Journal of Cleaner Production. 2024 Feb 28:141403.	9.7
3	Karishma SM, Rajak U, Naik BK, Dasore A, Konijeti R.	Performance and emission characteristics assessment of compression ignition engine fuelled with the blends of novel antioxidant catechol-daok biodiesel. Energy. 2022 Apr 15;245:123304.	9
4	Arunkumar M, Kannan M, Murali G.	Experimental studies on engine performance and emission characteristics using castor biodiesel as fuel in CI engine. Renewable Energy. 2019 Feb 1;131:737-44.	9
5	Murugan M, Saravanan A, Elumalai PV, Murali G, Dhineshbabu NR, Kumar P, Afzal A	Thermal management system of lithium-ion battery packs for electric vehicles: An insight based on bibliometric study. Journal of Energy Storage. 2022 Aug 1;52:104723.	8.9
6	Santhosh S, Tamizhdurai P, Kavitha C, Mangesh VL, Kumar NS, Basivi PK, Al-Fatesh AS, Kumaran R.	ZrO2/SO4/Cu nanoparticles supported on reduced graphene oxide for selective oxidation of propylene glycol in continuous reactor. International Journal of Hydrogen Energy. 2023 Sep 30;48(82):31978-95.	8.1
7	Nagaraju V, Murali G, Bewoor AK, Kumar R, Sharifpur M, Assad ME, Awad MM.	Experimental study on performance of single slope solar still integrated with sand troughs. Sustainable Energy Technologies and Assessments. 2022 Mar 1;50:101884.	7.1
8	Reddy SR, Murali G, Shaik AA, Raju VD, Reddy MS	Experimental evaluation of diesel engine powered with waste mango seed biodiesel at different injection timings and EGR rates. Fuel. 2021 Feb 1;285:119047.	6.7
9	Surase RS, Konijeti R, Chopade RP	Thermally efficient gas turbine with pressure drop-based automated filter cleaning and optimized fuel control system. Applied Thermal Engineering. 2024 Apr 1;242:122385.	6.1
10	Harez Rashid Ahmed, Kawan F Kayani, Anu Mary Ealias, Giphin George,	Biochar as an Eco-friendly Adsorbent for Ibuprofen Removal via Adsorption: A Review", Inorganic Chemistry Communication, Volume 170, Part 2, December 2024, 113397	4.4

KEY PUBLICATIONS

1) Kashif Tanzil, Anu Mary Ealias, Giphin George, Sagarika Panigrahi, Microplastics: A hidden carrier of per- and polyfluoroalkyl substances and their effect on soil properties, Volume: 13, (2025), Journal of Environmental Chemical Engineering.
2) Mangesh V.L., Govindarajan, Murali, Raju Chekuri, Rama Bhadri, Perumal, Tamizhdurai Perumal T., "Ni-Fe bimetallic catalysts with high dispersion supported by SBA-15 evaluated for the selective oxidation of benzyl alcohol to benzaldehyde, Volume: 14, (2024), RSC Advances.
3) V LMangesh, Selective oxidation of veratryl alcohol to veratraldehyde using more active catalyst in a continuous reactor, Volume :28, (2024), Journal of Saudi Chemical Society
4) Giphin George, Anu Mary Ealias, Manickam Puratchiveeran Saravanakumar, Advancements in textile dye removal: a critical review of layered double hydroxides and clay minerals as efficient adsorbents, Volume: 24, (2024), Environmental Science and Pollution Research.
5) Masthan Vali, P. S. N., Murali, G. Battery Thermal Managementsystem On Trapezoidal Battery Pack With Liquid Cooling Systemutilizing Phase Change Material Asme Journal Of Heat And Masstransfer
6) Masthan Vali, P. S. N., Murali, G. Experimental Study On Thermalmanagement Of Nano Enhanced Phase Change Materialintegrated Battery Pack Asme Journal Of Heat And Masstransfer
7) Emeema, J., Murali, G., Reddi, B.V. And Mangesh, V.L., Investigationson Paraffin Wax/Cqd Composite Phase Change Material-Improvedlatent Heat And Thermal Stability Journal Of Energy Storage
8) Murali, G., Vali, P.S.N. Masthan Experimental Studies On Solarreusable Can Air Heating System Integrated With Latent Heatstorage Journal Of Thermal Analysis And Calorimetry
9) Nagaraju V, Murali G,Experimental Study On Performance Ofsingle Slope Solar Still Integrated With Sand Troughssustainable Energy Technologies And Assessments
10) Nagaraju V, Murali G, Sankeerthana M A Review On Recentdevelopments Of Solar Stills To Enhance Productivity Usingnanoparticles And Nano-Pcminternational Journal Of Greenenergy
11) Kurhade As, Murali G Thermal Control Of Ic Chips Using Phasechange Material: A Cfd Investigation International Journal Ofmodern Physics C
12) Reddy, S. R., Murali, G Experimental Evaluation Of Diesel Enginepowered With Waste Mango Seed Biodiesel At Different Injectiontimings And Egr Rates Fuel
13) Reddy, S. R., Murali, G Combined Influence Of Compression Ratioand Egr On Diverse Characteristics Of A Research Diesel Enginefueled With Waste Mango Seed Biodiesel Blend Energy Sources,Part A: Recovery, Utilization, And Environmental Effects
14) Emeema Janumala, Murali Govindarajan Exploring Thermaldynamics Of Polyaniline-Modified Paraffin Wax Phase Changematerial With Varied Pani Loadings (1–4% Wt.).Heat And Masstransfer
15) Murali G, Sravya Gs, Jaya J, Vamsi Vn A Review On Hybrid Thermalmanagement Of Battery Packs And It's Cooling Performance Byenhanced Pcm Renewable And Sustainable Energy Reviews

OTHER ACHIEVEMENTS

S.NO	Name of the Faculty	Name of the Award	Year	Proof
1	Dr.K.Rama Krishna	Dr.saravapalli radhakrishna teacher excel-lent award	2020	 Dr. K.Rama Krishna Dean-IQAC  Dr.Sarvepalli RadhaKrishnan Teacher's Excellence Award (2020)
2	Dr.G.Murali	International outstand-ing Research award	2023	 Dr. G.Murali Professor  International Outstanding Researcher Award(2023)

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