Curriculum Vitae

Name	**Sameer Khandekar (Dr.-Ing., FNAE, FIE)**
Date of Birth	November 10, 1971 (Jabalpur MP, India)
Designation	Sir M. Visvesvaraya Chair Professor
	Former Head, ME and NET (01 Feb 2020 – 31 Jan, 2023)
	Professor (HAG) since August 2021
	Professor (June 2014-July 2021) and Head (ME) – (since February 2020)
	Associate Professor: May 2009 – May 2014
	Assistant Professor: September 2004 - April 2009
Present Address	Department of Mechanical Engineering
	Indian Institute of Technology Kanpur
	Kanpur (UP) - 208 016 INDIA
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Academic qualifications

- Ph. D. - University of Stuttgart, Stuttgart, Germany, 2004.

Thesis title: Thermo-Hydrodynamics of Closed Loop Pulsating Heat Pipes

Summary of Doctoral Thesis:

This research was focused on pulsating heat pipe (PHP) technology, as applicable to high heat flux electronics thermal management. The seminal thesis contribution was systematic development of PHP technology from a conceptual level to real-time engineering applications. Major thermo-mechanical boundary conditions governing the system dynamics were identified with the help of careful experiments involving infra-red thermography coupled with high speed videography. The relationship between the prevalent two-phase flow patterns inside the device vis-à-vis thermal performance and the system instability was established. Successful operation with heat flux handling capability of over 40 W/cm^2 was demonstrated. Semi-empirical modeling and modeling based on artificial neural networks was also undertaken during the research. The systematic experiments/modeling have brought forward the subtleties of the novel device and have proved that these self-excited thermally driven passive two-phase systems can indeed cater to the ever increasing thermal management demands from various industry sectors. The research has led to the fundamental understanding of enhanced passive heat transfer technology incorporating self-sustained thermally driven oscillating two-phase flows; concrete engineering design rules have evolved through the publications ensuing out of the thesis.

- M. Tech. (Thermo-fluid Sciences) - Indian Institute of Technology Kanpur, India, 2000.

Thesis title: Numerical Modeling of Packed Bed Type Catalytic Converter for Small Two-Stroke Petrol Engines and its Experimental Validation

Summary of Master Degree Thesis:

This thesis was part of the sponsored research project from the Indian Oil Corporation Limited (IOCL). In this work, a one-dimensional, plug flow, non-adiabatic, pseudo-homogeneous, steady-state mathematical model was developed for tubular packed bed type exhaust catalytic converters for small two-stroke application. The model incorporated a two-step oxidation of propane and oxidation of carbon monoxide present in the exhaust stream with simultaneous diffusion and reaction taking place in the palletized catalyst. The model was validated with already published experimental data. In addition, an experimental set-up was also designed and fabricated to validate the mathematical model. A tubular packed bed type catalytic converter was fabricated with noble metal impregnated, cordierite support, bead catalyst supplied by IOCL and fitted to a commercial petrol driven 780 VA, Yamaha LG900, 2 stroke portable generator set. Conversion characteristics were recorded using a Horiba four gas exhaust analyzer. Axial temperature gradients and pressure drop across the converter were recorded and validated.

- B. E. (Mechanical Engineering) - Government Engineering College, Jabalpur (MP), India, 1993.

Project title: Development of a microprocessor (8085) based thermo-mechanical control system

Fields of interest

- Phase-change heat transfer, Heat Pipes and Thermosyphons, Energy systems.
- Innovation and Entrepreneurship

Academic achievements - Timeline

- Best doctoral thesis awarded to Maneesh Punetha by ME Department, IIT Kanpur, 2020.
- Excellence in Teaching Award by IIT Kanpur, 2020.
- Elected Fellow of Indian National Academy of Engineering, November 2019.
- Sir M. Visvesvaraya Chair Professor, IIT Kanpur, May 2017 - ongoing.
- Awarded the Fellowship of the Institute of Engineers India, 2016.
- Best doctoral thesis awarded to Mauro Mameli by the Italian Thermodynamics Union, 2013.
- P. K. Kelkar Research Fellowship from IIT Kanpur (October 2009 - September 2012).
- Invited member of the academic senate of GEC, Amravati, July 2011 - ongoing.
- Member of the academic senate of Indian Institute of Information Technology Design and Manufacturing Jabalpur (MP) during June 2009 – May 2012.
- Recipient of DAAD Research Fellowship, Summer of 2011.
- Prof. K. N. Seetharamu Young Researcher Medal and Prize from the Indian Heat and Mass Transfer Society, 2010.
- George Grover Young Scientist Medal from International Heat Pipe Committee, 2007.
- Nominated member of the academic senate of IIT Kanpur, December 2006 - November 2007.
- Member of the International Heat Pipe Committee since April 2007.
- Young Scientist Award by the Department of Atomic Energy, Government of India, 2005.
- Doctoral dissertation grade 1 on a scale of 4 (Highest possible grade; “Summa Cum Laude”).
- First position, M. Tech. Program (Thermo-fluid Sciences), IIT Kanpur, India, CPI = 9.72/10.
- Five university gold medals for various achievements including first position in the under-graduate Mechanical Engineering program of Government Engineering College, Rani Durgavati Vishvavidyalaya, Jabalpur (MP) India.
- National merit scholarship for the entire undergraduate education in India, 1989-1993.
- Lions Club award for best all-round intermediate level; student, 1989.

Member of editorial board

Ongoing

- *Associate Editor: International Journal of Thermal Science, Elsevier*
- *Associate Editor: Interfacial Phenomena and Heat Transfer,* Begell House Inc., USA.

Term Completed

- *Heat Pipe Science and Technology: An International Journal*, Begell House Inc., USA.
- *Frontiers in Heat Pipes*, published by Global Digital Center, USA.

Academic/Research visits (International)

- Research visit to Kutateladze Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, May-July, 2019 (Eight weeks).
- Research visit to Huazhong University, Wuhan, China and Xi'an Jiaotong University, Xi'an, China for initiating the BRICS multinational project, October 2018, (Two Weeks)
- Research visit to Kutateladze Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, June-July, 2018 (four weeks).
- Research + Teaching visit to University of Pisa, Italy, May-June, 2018 (Six Weeks)
- Research visit to Kutateladze Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, December 2017 (one week).
- Resource person for one day seminar on Commercializing Intellectual Capital, Sultan Qaboos University, Muskat, Oman, April 17, 2016.
- Research visits (04) sponsored by CEFIPRA/IFCPAR, CETHIL, INSA-Lyon, France.
- Invited Professor at Korea Advanced Institute of Science and Technology, Daejeon, Korea, February, 2014 (1 week).
- Invited Professor at the Center for Thermal Sciences (CETHIL) at INSA-Lyon, France.
    - May-July 2012 (08 weeks).
    - May-July 2008 (10 weeks).
- DAAD Research Fellow at the Institute of Technical Thermodynamics, Technical University of Darmstadt, Darmstadt, Germany, May-July 2011 (8 weeks).
- Invited Professor at the Heat Pipe Laboratory, University of Chiang Mai, Chiang Mai, Thailand, September 2006 (2 weeks).
- Invited Professor at the Federal University of Santa Catarina, Florianópolis, Brazil, May-July 2005 (10 weeks).

Industry experience

Immediately after under-graduate education, worked as Marine Power Plant Engineer Officer (July 1994- June 1998) onboard seagoing merchant vessels for about four years (Larsen & Toubro Limited, Mumbai and Barber Ship Management, Malaysia), including one year as a marine engineering trainee in naval workshop/ dry-docks at Mumbai. Specifications of the two vessels are:

- MV Ganta (Car Carrier): Main propulsion marine diesel engine MITSUBISHI SULZER 6RND 68M, 11400 BHP, @150 rpm, with Auxiliary Vertical Boiler and Exhaust Gas Boiler of working pressure = 8 bar, Marine Generator Sets, 2 Nos., YANMAR-6UAL-ST.

- MV LT Pragati (Bulk Carrier): Main propulsion Marine Diesel Engine - MITSUBISHI SULZER 6RTA 58M, 9600 BHP, @116 rpm, with Auxiliary Vertical Boiler and Exhaust Gas Boiler of working pressure = 12 bar, Marine Generator Sets, 2 Nos., YANMAR-6UAL-ST.

GOI Certificate courses completed: Fire fighting at sea, Survival at sea, Engine room simulator, and Eligibility certificate for Second Engineer Officer.

Teaching experience

- Course instructor
  - Conduction and Convection: Fundamentals and Applications (NPTEL-online)
  - Refrigeration and Air Conditioning - (ME340A: Undergraduate elective course) **
  - Communication Skills - (ME399A: Undergraduate compulsory course)
  - Thermodynamics - (ESO201A: Undergraduate compulsory elective)
  - Microscale Thermal Transport - (SE381: Undergraduate science elective)
  - Internal Combustion Engines - (ME359: Undergraduate elective course) **
  - Fluid Mechanics & Rate Processes - (ESO212: Undergraduate compulsory core course)
  - Heat and Mass Transfer - (ME341: Undergraduate compulsory course) **
  - Liquid-Vapor Phase-Change Technology - (ME639: Postgraduate elective course) **
  - Boiling and Condensation - (ME742: Postgraduate elective course) **
  - Conduction and Radiation - (ME641: Postgraduate compulsory course) **
  - Energy Conversion Systems - I - (ME301: Undergraduate compulsory course)
  - Nuclear Power Engineering- I - (NT611: UG/PG elective course) - Invited Lectures
  - B. Tech. Project (ME451/ME452: Undergraduate compulsory core course)
- Course Tutor/ Laboratory Instructor
  - Technical Arts Laboratory - (TA101: Undergraduate compulsory course)
  - Special Studies/ Project in Design - (DES698: Postgraduate elective course)
  - Special Studies/ Project in Design - (DES698: Postgraduate elective course)
  - Thermodynamics - (ESO202: Undergraduate compulsory core course) **
  - Communication Skills - (COM200: Undergraduate compulsory course) **
  - Fluid Mechanics and Rate Processes - (ESO212: Undergraduate compulsory course) **
  - Technical Arts Laboratory - (TA201: Undergraduate compulsory course)
  - Heat Transfer Laboratory - (ME471: Undergraduate compulsory course)
  - Introduction to the Profession - (ME100: Undergraduate compulsory course)
- Special Courses
  - Phase-change Thermal Systems, short term course (with Dr. Vishwas Wadekar), 30 participants, pre-conference ISHMT-2019-Roorkee, December 26-27, 2019.
  - Operation and Maintenance of PSA Oxygen Plants, short term course (with Dr. Malay Das), 85 participants, Ministry of Skill Development and Entrepreneurship, 2021.
  - Phase-change Thermal Systems, short term course (with Dr. Vishwas Wadekar), 30 participants, pre-conference ISHMT-2019-Roorkee, December 26-27, 2019.
  - Phase-change Thermal Systems, short term course (with Dr. Vishwas Wadekar), 30 participants, pre-conference ISHMT-2017-Hyderabad, December 26-27, 2017.
  - Industrial Heat Transfer Systems with Phase-change: in-house training to about 80 industry participants at Mumbai and Delhi (2008 and 2009).
  - Invited Lecture Series (2 weeks) on Heat Pipe Science and Technology delivered at five universities in Thailand during September 2006.
  - Invited Course (Short Term - 24 hrs, 12 Graduate Students) on 'Heat Pipe Science and Technology' - Summer Vacation 2005 (8 weeks) at Federal University of Santa Catarina, Florianópolis, Brazil.
  - Quality Improvement Program (QIP)/ CDTE short term courses (04).
  - Teaching Assistant (TA101 and Advanced IC Engines) during M. Tech. Program at IIT Kanpur

** ***Note: Special mention by IITK academic senate as an 'Outstanding Teacher'.***

M. Tech. theses advising

- Completed: 58 (06 as co-advisor; 04 as MT Projects)
- Ongoing students: 03 (02 MT and 01 MSR)

Ph.D. theses advising/co-advising

- **Completed: 13**
  - Maneesh Bhendura: Evaporation-driven Convective Flow in an Air-Water System Enclosed in a Top-cooled Cavity (as co-advisor with Dr. K. Muralidhar), Thesis submitted, July 2023.
  - Gopinath Sahu, Thermal Management of High-Power Devices by Liquid Jets and Sprays, (Co-advisor: Prof. K. Muralidhar), April, 2023.
  - Ram Krishna Shah, Single-phase and Two-phase Convective Transport Phenomena in Ferrofluids, March 2023
  - Ankush Kumar Jaiswal, Drop-on-Drop Impact on a Superhydrophobic Substrate, August 2022.
  - Prem Kumar, Design and Development of Loop Heat Pipes for Terrestrial and Avionic Applications, August 2021.
  - Maneesh Punetha, Containment Thermal Hydraulic Studies Towards Understanding Post-Severe Nuclear Accident Scenarios, October 2020.
  - Mahesh Kumar Yadav: Steam Condensation in the Presence of non-condensable gases: A Nuclear Severe Accident Perspective, March 2019.
  - Praveen M. Somwanshi: Coalescence Characteristics of Liquid Drops on a Hydrophobic Surface with Application to Dropwise Condensation, December 2018 <as co-advisor>.
  - Vyas Srinivasan: Thermo-hydrodynamics of Isolated Taylor Liquid Plugs, August 2018.
  - Balkrishna Mehta: Local Convective Thermal Transport in Single-/Two-Phase Non-Pulsating and Pulsating Flows in Square Mini-channels, June 2014.
  - Basant Singh Sikarwar: Modeling Dropwise Condensation Underneath Inclined Textured Surfaces (as co-advisor in association with Dr. K. Muralidhar), April 2013 (as co-advisor with Dr. K. Muralidhar).
  - Manoj Kumar Moharana: Thermo-hydrodynamics of Internal Convective Flows in Mini-/ Micro channels, December 2012.
  - Mauro Mameli: Pulsating Heat Pipes: Numerical Modeling and Experimental Assessment, University of Bergamo, Italy (as co-advisor with Dr. Marco Marengo), April 2011 <as co-advisor>.
- **Ongoing Students: 03**

  Topic 1: Debartha Chatterjee: Solar water purification/desalination

  Topic 2: Soham Goswami: Fog harvesting

  Topic 3: Tarun Kulshrestha: Evaporation heat transfer

Sponsored Research Projects

Ongoing (03)

1. **Thermosyphon based passive interfacial solar steam generation for high-productivity desalination**

   Sponsoring agency: Science and Engineering Research Board, DST
   Time schedule: 3 Years (June 2021 – May 2024)
   Role: Project Investigator

   In this project, we are developing systems for efficient use of solar energy for water desalination system based on passive heat pipe technology.

2. **Engineering fibers for fog harvesting and interfacial solar water purification**

   Sponsoring agency: Ministry of Textiles (MoT)
   Collaborating Institute: Uttar Pradesh Technical Textile Institute, Kanpur
   Time schedule: 3 Years (June 2021 – May 2024)
   Role: Project Investigator

   In this project, we, along with the partner institute are engineering fibers for harvesting hog and use in solar water purification system.

3. **Dropwise Condensation of Water Vapor Over Patterned Surfaces**

   Sponsoring agency: Science and Engineering Research Board, DST
   Time schedule: 3 Years (January 2021 – December 2023)
   Role: Co-Project Investigator

   In this project, transport phenomena during dropwise condensation over patterned surfaces is being explored.

Completed (25)

1. **Y20 - Youth Consultation Summit 2023**

   Ministry of Youth Affairs and Sports
   On April 06, 2023
   Role: Co-Principal Investigator

2. **Third Party Inspection of UP Government HVAC/Cold Storage Plants**

   Uttar Pradesh Government (Consultancy Mode)
   Time: 12 Months
   July 2022 - June 2023
   Role: Principal Investigator

3. **Third Party Inspection of Medical Gas Pipeline**

   Uttar Pradesh Projects Limited (Consultancy Mode)
   Time: 12 Months
   July 2021 - June 2022
   Role: Principal Investigator

4. Third Party Inspection of PSA Oxygen Plants

Uttar Pradesh Projects Limited (Consultancy Mode)
Time: 12 Months
July 2021 - June 2022
Role: Principal Investigator

5. Design of De-icing system for the MLH Hangar

Sponsoring agency: Air Force Station, Srinagar (Consultancy Mode)
Time schedule: 3 Months
July 2022 - September 2022
Role: Project Investigator

In this project, a de-icing system was designed (and installed subsequently) so that there is no ice -accumulation of the roof top of the MLH hangar.

6. Thermal Analysis of MLH Hangar

Sponsoring agency: Air Force Station, Srinagar (Consultancy Mode)
Time schedule: 3 Months
February 2021 - April 2021
Role: Project Investigator

In this project, the thermal analysis of the MLH hangar located at the Air Force Station at Srinagar was undertaken to ascertain its efficacy for year-round operation. Suggestions were made to ensure intended operation, which were implemented.

7. Development of novel cooling systems for high power LEDs for enhanced reliability and lifetime

Sponsoring agency: BRICS Multi-lateral Cooperation (DST)
Collaborating Countries: India, China and Russia
Time schedule: 3 (+ 0.5) Years (April 2018 – October 2021)
Role: Project Investigator

In this project, we, along with the international partners from China and Russia, developed high heat flux cooling solutions for futuristic LEDs by various active and passive cooling techniques.

8. Hydrodynamics of micro-droplets interacting with engineered surfaces

Sponsoring agency: Department of Science and Technology, Government of India (Indo-Russia Call)
Time schedule: 3 Years (January 2019 – June 2021)
Role: Co-Project Investigator (PI: Dr. K. Muralidhar)

In this project, we, along with partners from Russia (Institute of Thermal Physics, RAS, Novosibirsk), tried to understand the basic interfacial mechanisms of droplet interacting with various types of surfaces, especially coalescing droplets under various boundary conditions.

9. Loop heat pipes for avionics and terrestrial applications

Sponsoring agency: Indo-French Center for Promotion of Advanced Research (Industry-Academia Collaboration Program) in association with Golden Star Technical Services Pvt. Ltd., Pune India, CETHIL, INSA-Lyon, France and Thales Avionics, France)
Time schedule: 3 Years (April 2017 - March 2020)
Role: Project Investigator

In this project, we, along with industry partners, developed Loop Heat Pipes for avionics and terrestrial application (nominal power = 60 W)

10. Studies on heat transfer during condensation of steam-hydrogen mixtures inside closed containments

Sponsoring agency: Bhabha Atomic Research Center

Time schedule: ongoing since August 2015 (four years)

Role: Principal investigator

In this project, we experimentally simulated a reactor containment vessel and investigated the role of non-condensable gases, including hydrogen, during steam condensation occurring on its walls. Possible real-time scenarios were simulated.

11. Fabricating of copper with carbon nanotube reinforcement for loop heat pipe application

Sponsoring agency: Indian Space Research Organization

Time: 2 years (August 2016 – July 2018)

Role: Co-Project Investigator (PI: Dr. Kantesh Balani, Material Science and Engineering)

The focus of the project was to develop specialized wicks for loop heat pipe application by powder metallurgical route.

12. Local heat transfer coefficient during film condensation of steam hydrogen mixtures

Sponsoring agency: Board of Research in Nuclear Sciences

Time schedule: 3 years (February 2015 – March 2018)

Role: Principal investigator

In this project, we have experimentally investigated the role of non-condensable gases, including hydrogen, in steam condensation occurring on nuclear reactor containment. The aim was to generate high quality local data in several flow configurations of interest under typical severe accident scenario.

13. Development of integrated heat pipe based passive thermal management platform with stress free mountings

Sponsoring agency: Indian Space Research Organization

Time schedule: 03 years (May 2015 – April 2018)

Role: Principal Investigator

In this project we have developed flexible mini heat pipes along with vibration isolating evaporator mountings for future satellites applications.

14. Statics and dynamics of micro-droplets formed on textured surfaces during condensation

Sponsoring agency: Board of Research in Nuclear Sciences

Time schedule: 03 years (July 2012 – June 2015)

Role: Co- Investigator (PI: Dr. K. Muralidhar, Department of Mechanical Engineering)

In this project, we investigated the role of calescence of droplets in the dropwise condensation process. Visualization of coalescing micro-droplets of various textured surfaces was undertaken and transport phenomena during coalescence was interpreted via image analysis and supportive modeling of the interfacial phenomena.

15. Thermo-hydrodynamics of oscillating Taylor bubble flows

Sponsoring agency: Indo-French Center for Promotion of Advanced Research, Ministry of Science and Technology, India and Ministry of Foreign Affairs, France

Time schedule: 03 years (September 2010 – August 2013)

Role: Principal Investigator, India (PI, France: Dr. Jocelyn Bonjour, INSA-Lyon)

Taylor bubble flows have been extensively studied in the past. Most of these studies are under (i) adiabatic conditions, (ii) not in the mini/micro geometries (iii) under steady flow conditions. Thus, the fundamental understanding of such flows is limited in mini/micro channel geometries, under phase-change processes and oscillating flow conditions. All these conditions are vital for emerging applications of mini/micro phase-change thermal-fluid systems, which routinely have oscillations, either intentionally generated or occurring due to flow instabilities. We explored the thermo-hydrodynamic response of oscillating Taylor flows under different boundary conditions and its subsequent effect on thermo-fluidic transport coefficients.

16. Development of pulsating heat pipe passive heat exchangers for nuclear engineering applications

Sponsoring agency: Bhabha Atomic Research Center, Government of India

Time schedule: 3 years (January 2009 – December 2012)

Role: Principal investigator

The main objective of the project was to carry out development and exploratory research on novel pulsating heat pipe-based heat exchangers. Comprehensive thermal characterization of the new compact heat exchangers has been undertaken.

17. Micro-devices for process applications

Sponsoring agency: Department of Science and Technology, Government of India

Time schedule: 05 years (April 2007 – March 2012)

Role: Co-investigator (Principal investigator: Dr. Deepak Kunzru, IIT Kanpur)

Use of micro-devices such as micro-mixers, micro-heat-exchangers and micro-reactors has several advantages over conventional systems for heat and mass transfer, chemical reactions and sensing. In this background, a microfabrication facility has been established and the following specific issues were addressed:

- Fabrication and evaluation of a microfuel processor for producing hydrogen by steam reforming of ethanol for fuel cell applications. The microfuel processor consists of integrated microreactor for steam reforming, water gas shift reaction and selective oxidation of carbon monoxide with the associated heat exchangers.
- Development and characterization of micro-heat-exchangers, including pressure drop characterization, measurement and prediction of heat transfer coefficients and flow pattern mapping for two-phase flow of ethanol-water mixtures.

18. Development of internet-based experiments (Pilot Phase Project)

Sponsoring agency: Ministry of Human Resources and Development, Government of India

Time schedule:0 3 years (April 2009 – March 2012)

Role: Principal investigator

The primary objective of this project is to develop mechanical engineering experiments (fluid mechanics and heat transfer) which can be performed over the internet in real time. The concept encompasses data acquisition during the experiment, storage, post-processing and online transmission of data to multiple users logged on to their respective web browsers. Control of the experimental process parameters from one (or more) remote stations over the web in real time is also being incorporated.

19. Design of heat transfer module for a specified control volume using heat pipes

Sponsoring agency: IRDE (DRDO), Dehradun

Time schedule: 06 months (January 2011 – June 2011)

Role: Principal investigator

The aim of the project was to develop a software for design of thermal modules with integrated heat pipes and validate the code with thermal testing in specified control volume/environment.

20. Design and development of pulsating heat pipe based compact heat exchangers

Sponsoring agency: Board of Research in Nuclear Sciences, Government of India

Time schedule: 03 years (April 2006 – March 2009)

Role: Principal investigator

Development of efficient compact heat exchangers is a vital need in view of the ever-increasing energy crisis. In this research work, novel and unique generic designs of compact heat exchangers were proposed which were based on a Pulsating Heat Pipe (PHP) concept. The specific objectives achieved in this research are:

- A new type of compact PHP based heat exchanger was designed and constructed.
- Thermal characterization of the new compact heat exchangers including internal pressure fluctuation measurement was undertaken.
- A visualization module of pulsating heat pipes to understand the internal thermo-physics of the oscillating two-phase flow was successfully tested.
- A preliminary mathematical model was developed.
- Potential applications in the nuclear industry were identified and suggested.

21. Development of pulsating heat pipes for space radiators

Sponsoring agency: Indian Space Research Organization, Government of India

Time schedule: 03 years (May 2005 - April 2008)

Role: Principal investigator

This research work explored the feasibility of pulsating heat pipe (PHP) plate structures for potential application as space thermal radiators. The specific work undertaken includes:

- Design of radiator plates with different configurations having embedded PHP structures,
- Thermal performance, heat transfer measurements and comparison of proposed designs,
- System level modeling using commercial CFD codes,
- Modeling two-phase flow in mini-channels and,
- Feasibility study with potential applications in space/ satellite thermal management.

22. Dropwise condensation over an inclined plate subjected to a vapor flux

Sponsoring agency: Board of Research in Nuclear Sciences, Government of India

Time schedule: 04 years (May 2005 - April 2009)

Role: Co-investigator (Principal investigator: Dr. K. Muralidhar, IIT Kanpur, India)

This project was oriented towards understanding drop-wise condensation process of a vapor flux over an inclined engineered surface in terms of pattern formation, leaching rates, heat transfer and stability characteristics. The specific objectives achieved during this work are:

- Experiments were conducted in a controlled environment to generate data on important parameters that dictate drop-wise condensation.
- A measurement technique to detect heat flux distribution, drop sizes and drop stability using Liquid Crystal Thermography was developed.
- Microscopic and Macroscopic mathematical models to validate experimental data concerning surface leaching and heat flux distribution were developed.
- Performance of metal vapor condensation process was predicted using the above models.

23. Development of high dissipative modular electronic packages

Sponsoring agency: European Commission

Time schedule: 03 years (April 2000 – March 2003)

Role: Project Associate (part of the doctoral assignment)

In view of the electronic industry trend for miniaturized products, three-dimensional packaging is envisioned. In this background the overall task of the project was:

- Design, development and testing of a novel modular stacked 3-D cubical microelectronic package with potential applications in avionics, space and telecom sectors.
- The project partners were Thales Avionics (France), Alcatel Space (France), Nokia (Finland), Electrovac (Austria), Customs Interconnect (United Kingdom), INSA Lyon - CETHIL (France) and University of Stuttgart - IKE (Germany).
- The task at IKE was to design, fabricate and optimize mini/micro heat pipe based thermal management strategies for the cubical electronic package. The generated data as also used by INSA-Lyon (CETHIL) for model validation.
- Delivery of complete thermo-mechanical prototype of a functional 3D package was successfully achieved with target specifications given by the end users i.e. space (Alcatel Space), telecom (Nokia Telecom) and avionics (Thales Avionics).

24. Development of infra-red thermography facility at IIT Kanpur

Sponsoring agency: Department of Science and Technology (FIST Research Funding)

Time schedule: 01 year (April 2007 – March 2008)

Role: Laboratory Coordinator

A high-speed high-precision infra-red thermography facility was developed at IIT Kanpur.

25. Modernization of heat transfer laboratory and research initiation in microscale multi-phase systems

Sponsoring agency: Indian Institute of Technology Kanpur, India

Time schedule: 01 year (April 2005 – March 2006)

Role: Laboratory Coordinator

A state-of-the-art modern experimental phase-change heat transfer laboratory has been developed at IIT Kanpur. The major equipment in the laboratory is:

- Clean Air Conditioned Laboratory Space (200 m^2), High Speed Infra Red Thermographic Camera, Laser Micromachining Station 200W, Helium leak detector facility, Table Top CNC Machine, Conventional Lathe, Milling Machine, Radial Drilling Machine, Fabrication Workshop, Constant Temperature Baths (4), 15mW He-Ne Laser, Optical Bench, High Speed/ High Precision NI Data Acquisition Systems (05), High Speed CCD Camera, Digital Videography/ Photography, Optical Microscope, Constant Voltage Stabilizers, UPS, Aqua-guard, Photocopier, Air Compressor, Vacuum Oven, PCs (10), Workstations (02)

Keynote lectures/ Invited Talks

International

1. **Transcending the Operational Limits of Conventional Heat Pipes for Passive Thermal Management**, Micro and Nanoscale Phase Change Phenomena, Gordon Research Conference, Barga (Lucca), Italy, January 08-13, 2023.

2. **Droplet-Droplet Interactions on Engineered Surfaces**, 48th Fluid Mechanics and Fluid Power Conference, BITS Pilani, December 27-29, 2021 (Online Event).

3. **Destination Europe for Researchers: My Experiences**, EU Day Webinar, Topic: Research and Development. October 12, 2021 (Online event).

4. **Spray Cooling: From Droplet Dynamics to System Level Perspectives**, Second Asian Conference on Thermal Sciences, 2nd ACTS, October 3-7, 2021 (Online).

5. **Droplet Dynamics and its Implications during Dropwise Condensation on Engineered Surfaces**, DROPLETS-2021, Darmstadt, Germany, August 16-18, 2021 (Online).

6. **New Developments in Passive Thermal Management Systems**, Topical Issues of Thermal Physics, Energetic, and Hydro-Gas-Dynamics in the Arctic Conditions, Yakutsk, Russia, July 12-17, 2021 (Online event).

7. **Educating Future Mechanical Engineers**, Brainstorming Workshop, Indian Institute of Science (sponsored by AICTE and INAE), 75th Year celebration, July 10, 2021.

8. **Development of Novel Cooling Systems for High Power LEDs for Enhanced Reliability and Lifetime**, TEQIP-III STTP on Flow Energy and Combustion, SV National Institute of Technology Surat, December 21-25, 2020 (Online event).

9. **Going Beyond Conventional Heat Pipes**, Next Generation Electronics Systems, Joint Workshop Binghamton University-IITM-IIT Ropar, October 06-08, 2020 (Online).

10. **On the Transport Phenomena of Steam, Hydrogen and Air inside Nuclear Reactor Containment Structures**, Plenary Lecture, International Conference on Recent Advances in Fluid and Thermal Sciences (iCRAFT 2018), Dubai, UAE, December 5-7, 2018.
11. **Advances in Simulating Dropwise Condensation Process,** Invited Lecture at the Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, July 12, 2018.
12. **Thermo-Hydrodynamics of Isolated Taylor Plug Flows**, Invited Lecture at the Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, December 13, 2017.
13. **Industry-Academia Interactions for Commercializing Technology,** One day seminar, Commercializing Intellectual Capital, organized by Small and Medium Entrepreneurship Fund and The Research council, Sultan Qaboos University, Muscat, Oman, April 17, 2016.

14. **Understanding Pulsating Heat Pipes: The Way Ahead**, Invited Lecture at the 1st International Symposium on Interfacial Phenomena and Heat Transfer, Novosibirsk, Russia, March 02-04, 2016.
15. **Local Thermo-hydrodynamics of Taylor Flows in the context of Pulsating Heat Pipes**, Invited Lecture at the Indo-German Workshop on Modeling and Measurement Techniques for Microscale flows, Chennai, India, February 23-25, 2015.
16. **Dropwise Condensation over Textured Surfaces: Influence of Drop Shape and Coalescence** (authored by Somvanshi P, Muralidhar K., and Khandekar S.), Keynote Lecture at the International Heat Transfer Conference, IHTC-15, Kyoto, Japan, August 2014 (presented by Prof. K. Muralidhar).
17. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes**, Keynote Lecture at the Paper # MNHMT2013-22088, 4th Micro/Nanoscale Heat and Mass Transfer International Conference, Hong Kong, China, December 12, 2013.

18. **Dropwise Condensation on Textured Surfaces: Progress and Prospects**, Invited Lecture at the Institute P'Prime, ENSMA (l'Ecole Nationale Supérieure de Mécanique et d'Aérotechnique), Poitiers, France, November 21, 2013.
19. **Pulsating Heat Pipe: An Overview**, Invited Lecture delivered to all the graduate students of Center for Thermal Sciences (CETHIL), INSA Lyon, France, June 2012.
20. **Hierarchical Modeling of Dropwise Condensation Process**, Institute lecture delivered at the INSA Lyon, France, July 2012.
21. **Dropwise Condensation on Horizontal Substrates with and without a Wettability Gradient**, Keynote Lecture at the 8th Minsk International Seminar (Heat Pipes, Heat Pumps, Refrigeration and Energy Systems), Minsk, Belarus, September 12-15, 2011.
22. **Pulsating Heat Pipe Heat Exchangers**, Proc. 21st International Symposium on Transport Phenomena, Kaohsiung City, Taiwan ROC, November 02-05, 2010.
23. **Dropwise Condensation on Textured Surfaces: Issues and Prospects,** Keynote Lecture at the 9th International ASME-ISHMT Heat and Mass Transfer Conference, Mumbai, India, January, 2010.
24. **Roadmap to Realistic Modeling of Closed Loop Pulsating Heat Pipes**, Proc. 9th International Heat Pipe Symposium, Kuala Lumpur, Malaysia, November, 2008.
25. **Multiple Steady States of a Pulsating Heat Pipe**, 7th Minsk International Seminar (Heat Pipes/Heat Pumps/Refrigerators/Power Systems), Minsk, Belarus, September 2008.
26. **Phase-Change Heat Transfer Activities at IIT Kanpur**, CETHIL, Center of Thermal Sciences, INSA de Lyon, France, May 2008.
27. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes**, Chiang Mai University, Thailand, September 2006.
28. **Emerging Importance of Microscale Heat Transfer**, Federal University of Santa Catarina, Florianopolis, Brazil, June 2005.
29. **Closed and Open Loop Pulsating Heat Pipes,** Proc. 13th International Heat Pipe Conference, Shanghai, China, 2004.
30. **State of the Art on Pulsating Heat Pipes,** Proc. 2nd ASME International Conference on Minichannels and Microchannels, Rochester (NY), USA, 2004.
31. **On the Definition of Pulsating Heat Pipes: An Overview**, Proc. 5th Minsk International Conference (Heat Pipes, Heat Pumps and Refrigerators), Minsk, Belarus, 2003.
32. **Pulsating Heat Pipes: Progress and Prospects**, Proc. 3rd International Conference on Energy and Environment, Vol. 1, pp. 723-730, Shanghai, China, 2003.

National

On Innovation, Entrepreneurship, and related topics:

1. **Making Future Engineers: Are We Doing Enough?** AICTE sponsored one-week Teachers' Training Program, organized by: Chhattisgarh Swami Vivekanand Technical University (CSVTU), Bhilai (C.G.), August 26, 2021.
2. **Elements of TBI Infrastructure and Challenges**, UP Start-up Conclave, Kanpur, March 18-19, 2017.
3. **Creating Innovation Eco-Systems: Challenges and Opportunities**, Three-day workshop on Innovation and Society, Indian Institute of Information Technology Design and Manufacturing, Jabalpur, December 5-6, 2016.
4. **Building up the Tinkering, Innovation and Entrepreneurship Eco-system**, One-Day Workshop, MVJ College of Engineering, Bangalore, September 23, 2016.

5. **Skill Development of Young Engineers** (Theme Speaker), 49th Engineers' Day Celebration, Institution of Engineers (India) in association with INAE/IEEE/IETE Kanpur Chapter, Kanpur, September 16, 2016.

6. **Ifs and Buts of Entrepreneurship as a Career Option**, SURGE popular lecture series, IIT Kanpur, June 22, 2016.

7. **Industry-Academia Partnership: Challenges and Opportunities**, One day workshop, PSIT Kanpur, April 15, 2016.

On technical research/ topics:

8. **Spray Cooling: From Droplet Dynamics to System Level Perspectives**, IIT Goa, June 21, 2023.

9. **Passive Thermal Management Technologies**, SVNIT Surat, June 13, 2023.

10. **Beat the Heat: Appreciating Thermal Science and Engineering**, Bajaj Science Center, Wardha, April 25, 2021 (Online).

11. **Thermal Management of High-Power LEDs**, A Three-Day National Webinar on Thermal Management of Electronics, IIIT RK Valley, RGUKT December14-16, 2020 (Online).

12. **Thermal Management of High-Power LEDs using Liquid-jet and Spray Impingement**, Short Term Training Program on Flow, Energy and Combustion, SVNIT Surat, December 23, 2020 (Online).

13. **Transport Phenomena and Thermodynamics**, Moradabad Institute of Technology, Moradabad, under the Faculty Development Program on Thermal Engineering, APJ Abdul Kalam Technical University, Uttar Pradesh, May 01, 2017.

14. **Thermodynamics of Phase-change Thermal Systems**, SRMS-CET, Bareilly, under the Faculty Development Program on Advanced Thermodynamics, APJ Abdul Kalam Technical University, Uttar Pradesh, August 05, 2016.

15. **Heat Pipes in Contemporary Thermal Management Strategies,** TEQIP sponsored short term course, Government College of Engineering Amravati (MS), July 20, 2016.

16. **Microscale Fabrication Technologies in Thermal Engineering**, Workshop on Micro & Nano Fabrication, Short Term Course, IIT Kanpur, March 16-20, 2015.

17. **What can I do?** Inspirational talk at Council for Science and Technology (CST-UP), Lucknow, Uttar Pradesh, 2015.

18. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes,** TEQIP sponsored short term course on Microscale and Nanoscale Heat Transfer, PESIT, Bangalore, December 26-27, 2013.

19. **Applications of Micro-/miniature Manufacturing in Thermal-Fluid Engineering**, National Symposium on Miniature Manufacturing in 21st Century, IIT-BHU Campus, August 16-18, 2013.

20. **Status of Contemporary Energy Usage Pattern**, National Conference: ENERGIZE 2011, organized by Gyan Ganga Institute of Technology, Jabalpur (MP), India, February 18, 2011.

21. **Learning through Real and Virtual Experiments,** Institute Lecture, Rajeev Gandhi Institute of Petroleum Technology, Rai Barely, January 2010.

22. **Internet based Real Time Experiments**, Institute Lecture, IIT Kanpur, October 2009.

23. **Remote Access Real Time Laboratory via Internet**, QIP short-term course titled Modern Experimental Techniques in Mechanics of Fluids and Solids, IIT Kanpur, May 2007.

24. **Non-Intrusive Temperature Measurement Techniques**, QIP short-term course titled Modern Experimental Techniques in Mechanics of Fluids and Solids, IIT Kanpur, May 2007.

25. **World Energy Resources: Status and Perspectives**, QIP short term course, IIT Kanpur (Course coordinator: Dr. B. P. Pundir), May 2007.

26. **Introduction to Transport Phenomena**, Short Term Refresher Course, Instrument Research and Development Establishment (DRDO), Dehradoon, November 2006.

27. **Transport Phenomena in Nanofluids**, QIP short term course on Recent Trends in Advanced Composites (Course coordinator: Dr. J. Ramkumar), November, 2006.

28. **Opportunities for Interdisciplinary Research in Energy Technology**, National Conference of Electrical and Mechanical Engineering, Guru Ramdas Khalsa Institute of Technology, Jabalpur (MP), March 2006.

29. **Introduction to Fuel Cell Technology: Energy Outlook and Research Directions**, National Workshop titled Fuel Cells: Power Device of the Future, IIT Kanpur, Kanpur (UP), February 2006.

Patents

1. **A Printed Circuit Board (PCB) Based Electro-Wetting-On-Dielectric (EWOD) Medical Diagnostic System,** Application Number: 202111053889, Granted - #416498, 2023.
2. **A Method for Transforming the Wettability of a Surface**, Provisional Patent filed ID #201711036788, October, 2017, Granted #360984, 2021.
3. **A Solar Energy Harvester System,** Provisional Patent filed ID #201711008821**,** 2017
4. **Device and Method for Nano-polishing of inner surface of tubes of varying cross section:** Patent filed, 201611025761 July 2016.
5. **An Integrated Solar Energy Harvesting and Storage,** Patent filed, 201611002574, **2016,** Granted # 410145, 2022.
6. **Shape Memory Alloy (SMA) wire as sensor for Taylor Bubble flow regime of two- phase flows:** Filed 903/DEL/2015, Granted, 2022.
7. **Unsteady wall heat flux sensor for extreme applications**
   Provisional Patent filed ID: 3977/DEL/2014, December 2014.
8. **Compact Air Cooler with Nano- Structured Surfaces**
   Provisional Patent filed ID: 3246/DEL/2014, November 2014. (Granted-2023)
9. **Nano-porous Microtubes for Heat and Mass Exchange Applications**,
   Provisional Patent filed ID: IN/875089, US - 14/818,250, November 2013
   <Commercialized>.
10. **Bicycle Mounted Solar Energy Harvesting Unit**,
    Provisional Patent filed ID: 2420/DEL/2014, August 2014.

Book/Book chapter/ Book Adaptation

- Books

1. Khandekar S. and Muralidhar K., **Drop Dynamics and Dropwise Condensation on Textured Surfaces**, ISBN 978-3-030-48460-6, Mechanical Engineering Series, Springer, 2020.

2. Phani B. V., Khandekar S. (Eds.), **Innovation, Incubation and Entrepreneurship: Case Studies from IIT Kanpur**, ISBN: 978-981-10-3333-9 (Print) 978-981-10-3334-6 (Online), Springer, 2017.

3. Khandekar S. (Editor), **Science and Technology of Heat Pipes, Historical Perspective to Contemporary Developments**, Proceedings of the 17th International Heat Pipe Conference, October 2013, ISBN: 978-1-56700-452-6, Begell House, 2015.

4. Joshi Y. and Khandekar S., **Microscale and Nanoscale Phenomena: Fundamentals and Applications,** Edited Book, Springer Tracts in Mechanical Engineering, ISBN 978-81-322-2288-0, June 2015.

5. Khandekar S. and K. Muralidhar, **Dropwise Condensation on Inclined Textured Surfaces**, to be published by Springer, ISBN 978-1-4614-8446-2, Thermal Briefs Series, 2013.

- Book Chapters

1. Somwanshi P., Muralidhar K., Khandekar S., **Coalescence Characteristics of Liquid Drops with Application to Dropwise Condensation**, Chapter in: Droplet and Spray Transport: Paradigms and Applications, Springer, ISBN 978-981-10-7232-1, 2018.

2. Lefèvre F., Khandekar S. and Bonjour J., **Thermally Induced Oscillating Flow inside a Single Capillary Tube: A Step Towards Understanding of the PHP Behavior**,

Encyclopedia of Two-Phase Flow and Heat Transfer (3rd Edition), World Scientific, ISBN: 978-981-4623-20-9, 2018.

3. Khandekar S., **Heat Pipes**, Chapter in: CRC Handbook of Thermal Engineering, 2nd edition, Ed.: Kreith F., and Chhabra R. P., ISBN 9781498715270 - CAT# K25334, CRC Press (Taylor and Francis), 2017.

4. Khandekar S. and Moharana M. K., **Axial Conduction during microscale internal convection**, Chapter in Microscale and Nanoscale Phenomena: Fundamentals and Applications, Springer Tracts in Mechanical Engineering, ISBN 978-81-322-2288-0, June 2015.

5. Khandekar S. and Moharana M. K., **Some Applications of Microscale Machining in Thermal Sciences**, Chapter in Introduction to Micromachining, Editor: Dr. V. K. Jain, ISBN: 978-81-8487-361-0, Narosa, 2013.

6. Groll M. and Khandekar S., **Micro Heat Pipes**, in Chapter on Microscale Boiling and Condensation, Heat Exchanger Design Handbook, Begell House, 2003.

- Book Adaptation Work for Indian Market (Published)

1. **Thermal Sciences** by Merle C. Potter, Elaine P. Scott adapted for Indian market, Thomson Press, ISBN-10: 0534385214, (Indian Edition), 2008.

2. **Engineering Thermodynamics** by Lynn D. Russell and George. A. Adebiyi adapted for Indian market, Oxford University Press, ISBN 0-19-568905-4 (Indian Edition), 2007.

3. **Introduction to Fluid Mechanics** by E. Shaughnessy, I. Katz and J. Schaffer adapted for Indian market, Oxford University Press, ISBN 0-19-567783-8 (Indian Edition), 2005.

List of publications

Archival refereed international journal publications

1. Goswami S., Sidhpuria R., and Khandekar S., **Effect of Droplet-laden Fibers on Aerodynamics of Fog Collection on Vertical Fiber Arrays**, Langmuir, Accepted for publication, November 2023.
2. Behndura M., Muralidhar K., Khandekar S., **Influence of a hydrophobic membrane on evaporation rate of water placed in a top-cooled circular cavity**, Desalination, Vol. 568, p. 117037, 2023.
3. Jaiswal A. K. and Khandekar S., Transient Heat Transfer during Consecutive Impact of Two Droplets on a Heated Substrate, International Journal of Thermal Sciences, p. 108546, 2023.
4. Chatterjee D., Khandekar S., **Solar Simulator for Long-Term Testing of Photothermal Materials**, IEEE Transactions on Instrumentation & Measurement, Vol. 72, p. 3000708, 2023.
5. Yadav P., Chatterjee D., Khandekar S., Transport Phenomena and Dynamics of an Evaporating Water Meniscus at Low Heat Fluxes, International Journal of Heat and Mass Transfer, Vol. 214 p. 124368, 2023.
6. Behndura M., Muralidhar K., Khandekar S., **An Improved Correlation of Evaporation Rate of Water Pool Derived using Combined ANN-GA**, Computational Thermal Sciences, Vol. 15(2), pp. 1-19, 2023.
7. Chatterjee D., Kulshrestha T., Khandekar S., **Continuous Vapor Generation for Thermal-Desalination Applications Using a Thermosyphon Based Heat Localization Strategy**, Desalination, Vol. 555, p. 116492, 2023.
8. Jaiswal A., Khandekar S., **Role of Offset during Drop-on-drop Impact Dynamics on a Superhydrophobic Substrate**, Results in Surfaces and Interfaces, Results in Surfaces and Interfaces, Vol. 10, 2023, p. 100102, 2023.
9. Sahu G. N., Khandekar S. and Muralidhar K., **Effect of Liquid Splattering on Thermal Performance of Jets and Sprays over Plain and Pillared Surfaces**, International Journal of Thermal Sciences, Vol. 187, pp. 108131, 2023.
10. Kole M., Shah R., Khandekar S., **Energy Efficient Thermal Management at Low Reynolds Number with Air-Ferrofluid Taylor Bubble Flows**, International Communication in Heat and Mass Transfer, Vol. 135, pp. 106109, 2022.
11. Sahu G. N., Khandekar S. Muralidhar K., **Thermal Characterization of Spray Impingement Heat Transfer over a High-Power LED Module**, Thermal Science and Engineering Progress, Vol. 32, 101332, 2022.
12. Dubey S., Ariharan S., Nisar A., Saini S., Jana S. S., Wangaskar B., Das A., Khandekar S., Maiti T., Omar S., Balani K., **Domination of Phononic Scattering in Solid Solutioning and Interfaces of HfB2–ZrB2 – SiC -Carbon Nanotube Based Ultra High Temperature Composites**, Scripta Materialia, Vol. 218, 114776, 2022.
13. Bhendura M., Muralidhar K., Khandekar S., **Determination of Evaporation Rate of Warm Water Placed inside a Partially-filled Top Cooled Enclosure**, International Journal of Thermal Sciences, Vol. 179, p. 107612, 2022
14. V., Slobodeniuk M., Bertossi R., Karmakar A., Martineau F., Romestant C., Bertin Y., Khandekar S., **Thermal Performances of a Flat-plate Pulsating Heat Pipe Tested with Water, Aqueous Mixtures and Surfactants**, International Journal of Thermal Sciences, Vol. 178, p. 107599, 2022.
15. Kumar P., Sahu G. N., Chatterjee D., Khandekar S., **Copper Wick based Loop Heat Pipe for Thermal Management of a High-power LED Module**, Applied Thermal Engineering, Vol. 211, p. 118459, 2022.
16. Shah R. K., Khandekar S., **Influence of External Magnetic Manipulation on Thermal Transport Characteristics of the Bubble-Slug Flow of Ferro-Nanocolloids**, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Vol. 646, p. 128936, 2022.
17. Pratap D. Shah R., Khandekar S. and Soni S., **Photothermal Effects in Small Gold Nanorod Aggregates for Therapeutic Applications**, Applied Nanoscience, Vol. 12, pp. 2045–2058, 2022.

18. Jaiswal A., Benard B., Garg V. and Khandekar S., **Evaporation Dynamics of Liquid Bridge Formed between Two Heated Hydrophilic and Hydrophobic Flat Surfaces, Interfacial Phenomena and Heat Transfer**, Vol. 10(1): pp. 1–14, 2022.
19. Somwanshi P., Cheverda V. V., Muralidhar K., Khandekar S., Kabov O. A, **Understanding Vertical Coalescence Dynamics of Liquid Drops over a Superhydrophobic Surface using High Speed Orthographic Visualization**, Experiments in Fluids, Vol. 63 (2), pp. 1-21, 2022.
20. Shah R., Khandekar S., **On-demand Augmentation in Heat Transfer of Taylor Bubble Flows Using Ferrofluids**, Applied Thermal Engineering, Vol. 205, pp. 118058, 2022.
21. Kumar P., Gachake M., Khandekar S., **Effect of Wick Oxidation on the Thermal Performance of a Copper Acetone Loop Heat Pipe**, Applied Thermal Engineering, Vol. 200, pp. 117627 (1-14), 2022.
22. Jaiswal A. and Khandekar S., **Drop-on-drop Impact Dynamics on a Superhydrophobic Surface**, Langmuir, Vol. 37, 43, pp. 12629–12642, 2021.
23. Jaiswal A. and Khandekar S., **Dynamics of a Droplet Impacting a Sessile Droplet on a Superhydrophobic Surface: Role of Boundary Conditions During Droplet Placement**, Journal of Flow Visualization and Image Processing, Vol. 28 (4), pp. 69-89, 2021.
24. Kole M. and Khandekar S., **Engineering Applications of Ferrofluids: A Review**, Journal of Magnetism and Magnetic Materials, Vol. 537, pp. 168222 (21 pages), 2021.
25. Punetha M., Yadav M.K., Jain S., Khandekar S., Sharma P.K., **Thermal-hydraulic Test Facility for Nuclear Reactor Containment: Engineering Design Methodology and Benchmarking**, Progress in Nuclear Energy, Vol. 138, pp. 103837 (20 pages), 2021.
26. Shah R. K. and Khandekar S, **Thermal Transport in Laminar Convective Flow of Ferrofluids in the Presence of External Magnetic Field**, ASME Journal of Heat Transfer, Vol. 143 (6), pp. 062101 (14 pages), 2021.
27. Srinivasan V., Rahatgaonkar A., Khandekar S., **Hydrodynamics of a Completely Wetting Isolated Liquid Plug Oscillating inside a Square Capillary Tube**, International Journal of Multiphase Flow, Vol. 135, pp. 103534, 2021.
28. Gatapova E. Ya., Sahu G., Khandekar S., Hu R., **Thermal Management of High-Power LED Module with Single-phase Liquid Jet Array**, Applied Thermal Engineering, Vol. 184, pp. 116270, 2021.
29. Khandekar S., Sahu G. N., Muralidhar K., Gatapova E. Ya., Kabov O., Hu R., Luo X., Zhao L., **Cooling of High-Power LEDs by Liquid Sprays: Challenges and Prospects**, Applied Thermal Engineering, Vol. 184, pp. 115640, 2021.
30. Jain A. K., Sharma A. K., Khandekar S., Bhattacharya B., **Shape Memory Alloy-based Sensor for Two-phase Flow Detection**, IEEE Sensors Journal, Vol. 20, Issue 23, 14209, 2020.
31. Somwanshi, P., Muralidhar K., Khandekar S., **Coalescence of Vertically Aligned Drops over a Superhydrophobic Surface**, Physics of Fluids, Vol. 32(5), pp. 052106-(1-20), 2020.
32. Bhanawat A., Yadav M. K., Punetha M., Khandekar S., **Effect of Surface Inclination on Filmwise Condensation Heat Transfer during Flow of Steam-Air Mixtures**, ASME Thermal Science and Engineering Applications, Vol. 12, pp. 041028 (1-13), 2020.
33. Yadav M. K., Punetha M., Bhanawat A., Khandekar S., Sharma P. K., **Steam Condensation Heat Transfer during Initial Blow-down Period of a Severe Nuclear Accident**, ASME Nuclear Engineering and Radiation Science, Vol. 6(4): 041108 (1-9), 2020.
34. Shah R. K., Khandekar S., **Manipulation of Taylor-Bubble Flow in a Magneto-Fluidic System**, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Vol. 593, 124589 (1-15), 2020.

35. Punetha M., Yadav M. K., Khandekar S., Sharma P. K., Ganju S., **Intrinsic Transport and Combustion Issues of Steam-Air-Hydrogen Mixtures in Nuclear Containments**, International Journal of Hydrogen Energy, Vol. 45, Issue 4, pp. 3340-3371, 2020.

36. Kumar P., Khandekar S., Maydanik Y., Bhattacharya B., **Effect of Vibrations on Thermal Performance of Miniature Loop Heat Pipe for Avionics Cooling: An Experimental Analysis**, ASME Journal of Heat Transfer, Vol. 141(9), pp. 091814 (1-9), 2019.

37. Shah R. and Khandekar S., **Exploring Ferrofluids for Heat Transfer Augmentation,** Journal of Magnetism and Magnetic Materials, Vol. 475, pp. 389-400, 2019.

38. Naidu G. D. and Khandekar S., **Boiling Micro-Jets Impinging at Sub-atmospheric Pressures: Visualization and Heat Transfer Characteristics**, Interfacial Phenomena and Heat Transfer, Vol. 6(4), pp. 437–449, 2018.

39. Mahanta T. R. and Khandekar S., **Evaporation Characteristics of a Confined Nanofluid Bridge between Two Heated Parallel Plates**, Journal of Flow Visualization and Image Processing, Vol. 25, Issue 3/4, pp. 293–324, 2018.

40. Somwanshi P., Muralidhar K. and Khandekar S., **Coalescence Dynamics of Sessile and Pendant Liquid Drops Placed on a Hydrophobic Surface**, Physics of Fluids, 30, pp. 092103 (1-14), 2018

41. Punetha M., Choudhary A., and Khandekar S., **Stratification and Mixing Dynamics of Helium in an Air Filled Confined Enclosure**, International Journal of Hydrogen Energy, Vol. 43, Issue 42, pp., 19792-19809, 2018.

42. Shirsath G. B., Pala R. G., Muralidhar K. and Khandekar S., **Effect of Salinity and Water Depth on the Performance of Doubly Inclined Solar Still**, Desalination and Water Treatment, Vol. 124, pp. 72-87, 2018.

43. Somwanshi P, Muralidhar K. and Khandekar S., **Dropwise Condensation Patterns of Bismuth Formed on Horizontal and Vertical Surfaces**, International Journal of Heat and Mass Transfer, Vol. 122, pp. 1024-1039, 2018.

44. Kumar P., Wangaskar B., Khandekar S. and Balani K., **Thermal-fluidic Transport Characteristics of Bi-porous Wicks for Potential Loop Heat Pipe Systems**, Experimental Thermal and Fluid Science, Vol. 94, pp. 355-367, 2018.

45. Singh S., Srinivasan V., Wangaskar B. and Khandekar S., **Dynamic Evolution of an Evaporating Liquid Meniscus from Structured Screen Meshes**, Transport in Porous Media, Vol. 121(2), pp. 539-555, 2018.

46. Yadav M. K., Singh S. K., Parwez A. and Khandekar S., **Inverse Models for Transient Wall Heat Flux Estimation based on Single and Multi-Point Temperature Measurements**, International Journal of Thermal Sciences, Vol. 124, 307-317, 2018.

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48. Singh S. K., Gogna M., Muralidhar K. and Khandekar S., **Combined Effect of Substrate Wettability and Thermal Properties on Evaporation Dynamics of a Sessile Droplet**, Interfacial Phenomena and Heat Transfer, Vol. 5 (4), pp. 321-335, 2017.

49. Punetha M. and Khandekar S., **A CFD based Modeling Approach for Predicting Steam Condensation in the Presence of Non-condensable Gases**, Nuclear Engineering and Design, Vol. 324, pp. 280-296, 2017.

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53. Singh S. K., Yadav M., Sonawane R., Khandekar S. and Muralidhar K., **Estimation of Time-dependent Wall Heat Flux from Single Thermocouple Data**, International Journal of Thermal Sciences, Vol. 115, pp. 1-15, 2017.

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70. Mehta B. and Khandekar S., **Investigation of the Heat Transfer Coefficient of Liquid and Gas Bubble Train Flow in a Square Mini-channel Using Infra-Red thermography**, Proc. 11th International Conference on Quantitative Infra-Red Thermography, Naples, Italy, Paper Reference Number 196, June 11-14, 2012.

71. Sikarwar B. S., Khandekar S. and Muralidhar K., **Effect of surface hydrophobicity on heat transfer during dropwise condensation: A numerical study**, Proc. 8th International ECI Boiling and Condensation Conference, (Paper No. OS-5-1578), Lausanne, Switzerland, June 3-7, 2012.

72. Majumder A., Mehta B. and Khandekar S., **An Experimental Study of Local Nusselt Number for Gas-Liquid Taylor Bubble Flow in a Mini-Channel**, 16th International Heat Pipe Conference, Lyon, France, Paper Reference Number 013, May 20-24, 2012.

73. Bajpai A. K. and Khandekar S., **Simulation of Heat Transfer in Liquid Plugs Moving Inside Dry Capillary Tubes**, 16th International Heat Pipe Conference, Lyon, France, Paper Reference Number 013, May 20-24, 2012.

74. Rao M., Lefevre F., Bonjour J. and Khandekar S., **Thermally Induced two-phase Oscillating Flow in a Capillary Tube: Theoretical and Experimental Investigations**, 16th International Heat Pipe Conference, Lyon, France, Paper Reference Number 106, May 20-24, 2012.

75. Sandeep Kumar Singh S.,S., Khandekar S., Srivastava P, Bajpai J. K., **Application of Mini Heat Pipes for Thermal Management of Opto-electronic Instruments**, 16th International Heat Pipe Conference, Lyon, France, Paper Reference Number 106, May 20-24, 2012.

76. Shah N., Rai N., Sharma S. and Khandekar S., **Intelligent Business Card Ecosystem Model, Presented in 'Design, a Catalyst of Sustainable India'**, Organized by DESIS Network- Design for Social Innovation and Sustainability Venue: National Institute of Design, Heritage Campus, Ahmedabad, January 2012.

77. Mehta B., Dhyani A., and Khandekar S., **Estimation of Laminar Single-phase Heat Transfer Coefficient in the Entrance Region of a Square Mini-channel using Infra-red Thermography**, Proc. 21st National and 10th International ISHMT-ASME Heat and Mass Transfer Conference, Chennai, India, December 27-30, 2011.

78. Pandey S., Hemadri V. A., Khandekar S. and Sharma P., **Passive Containment Cooling: Model and Experiments**, Proc. 21st National and 10th International ISHMT-ASME Heat and Mass Transfer Conference, Chennai, India, December 27-30, 2011.

79. Mameli M., Khandekar S. and Marengo M., **An Exploratory Study of a Pulsating Heat Pipe Operated with a Two-component Fluid Mixture**, Proc. 21st National and 10th International ISHMT-ASME Heat and Mass Transfer Conference, Chennai, India, December 27-30, 2011.

80. Sikarwar B., Khandekar S. and Muralidhar K., **Simulation of Dropwise Condensation underneath a Chemically Textured Substrate with a Wettability Gradient**, Proc. 21st

National and 10th International ISHMT-ASME Heat and Mass Transfer Conference, Chennai, India, December 27-30, 2011.

81. Sikarwar B., Khandekar S. and Muralidhar K., **Dropwise Condensation of Liquid Metal Vapor underneath a Flat Inclined Substrate**, Proc. 7th International Conference on Computational Heat and Mass Transfer (Paper #135), Istanbul, Turkey, July 18-22, 2011.

82. Jafary M. and Khandekar S., **Simulation of Droplets on Inclined Surfaces using Smooth Particle Hydrodynamics**, Proc. 7th International Conference on Computational Heat and Mass Transfer (Paper #136), Istanbul, Turkey, July 18-22, 2011.

83. Mameli M., Khandekar S. and Marengo M. **Flow Patterns and Corresponding Local Heat Transfer Coefficients in a Pulsating Heat Pipe**, Proc. 29th National Heat Transfer Conference of Italy, Politecnico di Torino, Torino, Italy, June 20-22, 2011.

84. Moharana M. K., Singh P. K. and Khandekar S., **Axial Heat Conduction in the context of Developing Flows in Microchannels**, 9th International Conference on Nanochannels, Microchannels and Minichannels (ICNMM2011 #58037), Alberta, Canada, June 19-22, 2011.

85. Das S. P., Lefevre F., Khandekar S. and Bonjour J., **Thermally Induced Oscillatory Two-phase Flow in a Mini-channel: Towards Understanding Pulsating Heat Pipes**, 9th International Conference on Nanochannels, Microchannels, and Minichannels (ICNMM2011-58107), Alberta, Canada, June 19-22, 2011.

86. Sikarwar B., Muralidhar K. and Khandekar S., **Flow and Thermal Fields in a Pendant Droplet Moving on a Lyophobic Surface**, Proc. 14th International Heat Transfer Conference, Washington DC, USA, August 8-13, 2010.

87. Mehta B. and Khandekar S., **Effect of Periodic Pulsations on Heat Transfer in Simultaneously Developing Laminar flows: A Numerical Study**, Proc. 14th International Heat Transfer Conference, Washington DC, USA, August 8-13, 2010.

88. Das S. P., Lefevre F., Bonjour J. and Khandekar S., **Parametric Study of a Two-phase Oscillating Flow in a Capillary Tube**, Proc. 15th International Heat Pipe Conference (IHPC), Clemson, USA, April 25-30, 2010.

89. Tripathi A., Khandekar S. and Panigrahi P. K., **Oscillatory Contact Line Motion Inside Capillaries**, Proc. 15th International Heat Pipe Conference (IHPC), Clemson, USA, April 25-30, 2010.

90. Sonawane Y. R., Khandekar S., Mishra B. K., SoundraPandian K. K., **Environment Monitoring and Control of a Polyhouse Farm through Internet**, Proc. 23rd National Convention of Agriculture Engineers and National Seminar on Agricultural Mechanization through Entrepreneurial Development, Rahuri, Ahmednagar (MS), India, February 6-7, 2010.

91. Agarwal G., Moharana M. K. and Khandekar S., **Thermo-hydrodynamics of Developing Flow in a Rectangular Mini-channel Array**, Proc. 20th National and 9th International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.

92. Battoo N. K., Khandekar S. and Muralidhar K., **Mathematical Simulation of Dropwise Condensation Exposed to Vapor Flux**, Proc. 20th National and 9th International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.

93. Sikarwar B., Muralidhar K. and Khandekar S., **Flow and Heat Transfer in a Pendant Liquid Drop Sliding on an Inclined Plane**, Proc. 20th National and 9th International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.

94. Shekhavat Y. S., Khandekar S. and Panigrahi P. K., **Hydrodynamic Study of an Oscillating Meniscus in a Square Mini-Channel**, Proc. 2nd Micro/Nanoscale Heat and Mass Transfer International Conference, Shanghai, China, December 18-21, 2009.

95. Hemadri V. and Khandekar S., **Thermal Performance Characterization of Embedded Pulsating Heat Pipe Radiators by Infrared Thermography**, Proc. 6th International Symposium on Multiphase Flow, Heat Mass Transfer and Energy Conversion, Xian, China, July 11-15, 2009.

96. Moharana M. K., Nageswara Rao P., Khandekar S. and Kunzru D., **Producing Hydrogen from Ethanol in a Microfuel Processor: Recent Developments and Challenges**, Proc. 6th International Symposium on Multiphase Flow, Heat Mass Transfer and Energy Conversion, Xian, China, July 11-15, 2009.

97. Khandekar S. and Groll M., **Roadmap to Realistic Modeling of Closed Loop Pulsating Heat Pipe**, Proc. 9th International Heat Pipe Symposium, Kuala Lumpur, Malaysia, November 17-20, 2008.

98. Rao M. and Khandekar S., **Thermo-hydrodynamics of developing flows in a mini-channel array: Liquid crystal thermography and numerical study**, Proc. 8th ASME/ISHMT International Heat and Mass Transfer Conference, Hyderabad, India, 2008.

99. Khandekar S. and Gupta A., **Embedded Pulsating Heat Pipe Radiators**, Proc. 14th International Heat Pipe Conference (IHPC), Florianópolis, Brazil, April 22-27, 2007.

100. Mehta B. and Khandekar S., **Two-phase Closed Thermosyphon with Nanofluids**, Proc. 14th International Heat Pipe Conference (IHPC), Florianópolis, Brazil, April 22-27, 2007.

101. Khandekar S. and Groll M., **Insights into the Performance Modes of Closed Loop Pulsating Heat Pipes and Some Design Hints**, Proc. 7th ASME/ISHMT Joint International Conference, IIT Guwahati, January 2006.

102. Khandekar S., Manyam S., Groll M. and Pandey M., **Two-phase Flow Modeling of Closed Loop Pulsating Heat Pipes**, Proc. 13th International Heat Pipe Conference, Shanghai, China, 2004.

103. Yang H., Khandekar S. and Groll M., **Operational Characteristics of Flat Plate Closed Loop Pulsating Heat Pipes**, Proc. 13th International Heat Pipe Conference, Shanghai, China, 2004.

104. Tang X., Hammel E., Findl W., Schmitt T., Thumfart D., Groll M., Schneider and Khandekar S., **Study of AlSiC Metal Matrix Composite Based Flat Plate Thin Heat Pipe**, Proc. 13th International Heat Pipe Conference, Shanghai, China, 2004.

105. Khandekar S., Welte T. and Groll M., **Thermal Management of 3D Microelectronic Modules - Experimental and Simulation Studies**, Proc. 12th International Heat Pipe Conference, pp. 384-389, Moscow, Russia, 2002.

106. Khandekar S., Cui X. and Groll M., **Thermal Performance Modeling of Pulsating Heat Pipes by Artificial Neural Network**, Proc. 12th International Heat Pipe Conference, pp. 215-219, Moscow, Russia, 2002.

107. Khandekar S., Groll M., Charoensawan P. and Terdtoon P., **Pulsating Heat Pipes: Thermo-fluidic Characteristics and Comparative Study with Single Phase Thermosyphon**, Proc. 12th International Heat Transfer Conference, ISBN-2-84299-307-1, Vol. 4, pp. 459-464, Grenoble, France, 2002.

108. Khandekar S., Groll M. and Luckchoura V., **An Introduction to Pulsating Heat Pipes**, Electronics Cooling Magazine, Vol. 9, Issue 2, pp. 38-41.

109. Khandekar S. and Sharma P., **Computer Aided Synthesis of Slider Crank Mechanism with Four Accuracy Points**, Proc. of NACOMM'93 - National Conference on Machines and Mechanisms, Indian Institute of Technology, Kharagpur, India, 1993.

110. Khandekar S. and Jhinge P., **Control of Condenser Unit Subsystem with a Microprocessor**, MECHVIBES'93, Regional Engineering College, Kurukshetra, India, 1993.

111. Khandekar S., Sharma P. and Sheorey T., **Finite Difference Analysis of Multi-pass Solar Collector**, Proc. of Seminar - 'Preserve Planet Earth', organized by The Institution of Engineers, Jabalpur, India, 1993.

Reviewer/ Community Activities

Langmuir, Physics of Fluids, International Journal of Heat and Mass Transfer, ASME Journal of Heat Transfer, ASME Thermal Science and Engineering Applications, International Journal of Thermal Sciences, Applied Thermal Engineering, Experimental Thermal and Fluid Sciences, Heat Transfer Engineering, AIAA Journal of Thermophysics and Heat Transfer, International Journal of Hydrogen Energy, Nuclear Engineering and Design, Annals of Nuclear Engineering, Applied Energy, Chemical Engineering Science, Energy, Microgravity Science and Technology, Advances in Electronics Packaging, International Heat Pipe Conference, Minsk International Seminar, Indian Society for Heat and Mass Transfer.

Administrative experience

International level responsibility

- Chairman: Committee on International Heat Pipe Conferences and Symposia, 2022-ongoing.

National level responsibilities

- **Visitor's nominee**, IIT Dharwad, 2022 - ongoing
- **Visitor's nominee**, All National Institutes of Technology, 2019 - ongoing
- **Member**, **DST-SERB PAC**, Mechanical, Aerospace, and Civil Engineering, 2019 – ongoing
- **Member, PRC, DST** International Collaborative Projects, 2023 - ongoing
- **Member, PRC, DST Vaibhav Scheme** 2023-ongoing
- **Member**, National Science Center, New Delhi, 2023-ongoing
- **Member,** INAE Member of Selection Committee (III) – Mechanical Engineering – 2023-ongoing
- **Member,** Board of Studies (Mechanical Engineering), KIIT Bhubaneswar, 2021 - ongoing
- **Member,** Board of Studies (Mechanical Engineering), LNMIIT Jaipur, 2021 – ongoing
- **Member,** Board of Studies, Uttar Pradesh Technical Textile Institute, Kanpur, 2021 – ongoing

Institute level responsibility

Ongoing:

- **Dean, Students' Affairs**, IIT Kanpur (01 October 2023 – ongoing)
- Chairman: Committee on establishment of School of Entrepreneurship at IIT Kanpur
- Coordinator: APPROACH CELL@IITK
- Coordinator, IIT-Ladakh initiative, October 2021-ongoing

Completed

- Member: Two-day National Symposium on role of Indian Scientists in the Indian Independence Movement, New Delhi, February 2021
- Member, DFAC, Department of Design, 2021-2022.
- Member, DFAC, Department of Sustainable Energy Engineering, December 2020-2022.
- Member, Convocation Committee, 2021
- Member, Screening Committee for Technology Showcasing, July 2021- August 2021.
- Chairman, Students' Entrepreneurship Policy drafting Committee, January 2021 - July 2021.
- Member, Institute Post-Graduate Academic Review Committee, 2018 - 2021.
- Chairman, Diamond Jubilee Celebrations Planning and Coordination Committee, 2018 - 2020.

- Academic Senate Parliamentarian, September 2018 – August 2019.
- Member, Staff Recruitment and Promotion Policy (Review), 2020-2021.
- Member, Ranking Committee, 2018-2019.
- **Associate Dean (Innovation and Incubation)** and Coordinator: SIDBI Innovation & Incubation Center, IIT Kanpur September 2015 - November 2017.
- Member, Institute Research and Development Committee (IRDC), 2012 - 2017.
- Professor-in-charge, Institute Air Conditioning Works, January 2013 - December 2015.
- Member, Institute Building Works Committee, January 2013 - December 2015.
- Member, Editorial Board, Bi-yearly Hindi Magazine - *Antas, January* 2012-December 2015.
- Founder Coordinator, Tinkering Laboratory, November 2012 - October 2015.
- Head, Central Workshop, IIT Kanpur, October 2011 - February 2015.
- Member, Industrial Collaboration Advisory Group, 2012 - 2014.
- Member, Institute Space Allocation Committee, 2012 - 2014.
- Member, Institute Social Responsibility Committee, 2012 - 2013.
- Institute Coordinator, NMEICT Virtual Laboratory Project (MHRD), 2007 - 2012.
- Member, Institute Environmental Advisory Committee, 2011 - 2012.
- Chairman, Organizing Committee, Annual Flower Show, 2012.
- Vice-Chairman, SPIC-MACAY National Convention, held during June 01-06, 2010.
- Coordinator, 'Golden Jubilee Open House', held on 8th February, 2010.
- Co-Chairman, 'Golden Jubilee Energy Conclave - 2010', held during January 8-15, 2010.
- Member, Board of Governors, Alumni Association, IIT Kanpur, April 2010 - March 2012.
- Treasurer, Alumni Association, IIT Kanpur - April 2008 - March 2010.
- Chairman, Institute Transport Users Committee - August 2006 - September 2008.
- Warden (Hall VII) July 2005 - June 2008, Warden-in-charge (March 2007 - June 2008).
- Faculty Counselor, Counseling Service, IIT Kanpur, 2006-2010.
- Member of IITK Golden Jubilee Celebrations' Planning and Coordination Committee.
- Member of Students' Festival Re-organization Committee.
- Participation in GATE/JEE/JAM operations.
- Various other institute level committees.

Department level responsibilities:

Ongoing

- Coordinator of the Refrigeration/AC Laboratory w. e. f. August 2005 – ongoing.

Completed

- **Head, Department of Mechanical Engineering and Nuclear Engineering and Technology Program**, February 2020 – January 2023.
- Faculty Affairs Committee, 2018-January 2023 (2020-2023 as HoD, ME).
- Coordinator of the Safety Committee, August 2014 – 2019.

- Convener of the Department Post-Graduate Committee (DPGC), September 2018 – August 2019.
- Coordinator of Teaching and Research Assistant Management Committee, September 2017 – August 2018.
- Member of NET Post Graduate Committee from September 2015 – August 2016.
- Member of Departmental Post Graduate Committee from September 2014 - August 2015.
- Coordinator NPTEL (National Program for Technology Enhanced Learning) 2009-2015.
- Member, Departmental Under-Graduate Committee, 2012-2014.
- Member of the advisory group to the Dean, Resources Planning and Generation 2011-2013.
- Convener of B. Tech. Project Evaluation Committee from June 2010 - May 2012 (two terms).
- Member of Departmental Under-Graduate Committee from September 2008-August 2012.
- Web-page Coordinator from September 2007 - August 2008.
- Member of B. Tech. Project Evaluation Committee from June 2006 - May 2007.
- Member of Departmental Post Graduate Committee from December 2006 - August 2008.
- Seminar Coordinator from September 2005 - August 2007.
- Member of ME Conference Room Renovation Committee, 2006.
- Coordinator of the Heat Transfer Laboratory from August 2005 - July 2009.
- Coordinator of winter industrial tour for B. Tech. students, December 2004.

Other national responsibilities

- **President**, Sopan Trust, August 2021 – ongoing.
- **President**, Shiksha-Sopan (NGO), 2005-2008; 2013-2020.
- **Treasurer**, Shiksha-Sopan, a voluntary organization run by IITK community working for socially and economically backward society living in villages around IIT Kanpur, 2008-2011; 2021-ongoing.
- **Treasurer**, INAE, Local Kanpur Chapter, 2020- ongoing.
- **Faculty Advisor**, Maharashtra Mandal, IIT Kanpur - ongoing.
- **Faculty Advisor**, Vivekananda Youth Convention, IIT Kanpur, January 15-16, 2011.

Coordination of short-term courses/workshops/conferences

1. **Course Coordinator**, Operation and Maintenance of PSA Oxygen Plant, Online training program, Ministry of Skill Development and Entrepreneurship, 2021.
2. **Conclave Co-Coordinator**, UP Startup Conclave: Entrepreneurship & Innovation in Academic Institutions: Challenges and Opportunities, March 18-19, 2017, in association with TEQIP/SPFU, UP.
3. **Workshop Co-Coordinator**, Intellectual Property: A Strategic Enabler for the Scientific & Research Community, Kanpur, India, April 08, 2017, in association with INAE Local Chapter, Kanpur.
4. **Chairman**, 17th International Heat Pipe Conference, 40th year jubilee conference, Kanpur, India, October 14-17, 2013.
5. **Workshop Coordinator** - International Workshop titled *Phase-change Thermal Systems*, IIT Kanpur (in association with Mr. Pavan Sharma, Reactor Safety Division, BARC, Mumbai), Kanpur, March 19-20, 2012.
6. **Workshop Co-Convener** - One-Day Workshop on *Virtual Laboratories*, IIT Kanpur, February 04, 2012 (in association with Dr. Kantesh Balani).
7. **Mentor (Guru)**, USID *Gurukul* - International Winter School for Participatory, Collaborative and Immersive Learning Experience (http://www.usidfoundation.org), November 26 - December 11, 2011.
8. **Course Coordinator** - Short Term course titled *Transport Phenomena in Phase-change and Reacting Systems*, IIT Kanpur, January 10-14, 2011 (in association with Dr. Malay K. Das, Department of Mechanical Engineering).
9. **Co-Chairman**: Golden Jubilee Energy Conclave 2010: Eight Day Workshop Series on *Energy*, January 08-15, 2010.
10. **Course Coordinator** - Short Term course titled *Modern Experimental Techniques in Mechanics of Fluids and Solids*, IIT Kanpur, May 07-11, 2007 (in association with Dr. V. Venkitnarayanan, Department of Mechanical Engineering).
11. **Workshop Coordinator** - National Workshop titled *Fuel Cell Technology: Progress and Prospects*, IIT Kanpur (supported by Shastri Indo-Canadian Institute, New Delhi), Kanpur (UP), March 2007.
12. **Workshop Coordinator** - National Workshop titled *Fuel Cells: Power Device of the Future*, IIT Kanpur, February 2006 (in association with Dr. A. K. Saha, Department of Mechanical Engineering).

Conferences/Seminars/Workshops participation (National/International)

1. Joint IITK-La Trobe University, Australia Research Symposium, November 26-28, 2023.
2. Joint 21th International Heat Pipe Conference and 15th International Heat Pipe Symposium, Melbourne, Australia, February 5-9, 2023.
3. Gordan Research Conference, Micro and Nanoscale Phase Change Phenomena, Lucca (Barga), Italy, January 08-13, 2023.
4. 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference, IIT Roorkee, India, 28-31st December 2019.
5. 13th International Conference on Two-phase Systems for Space and Ground Applications, Xi'an, China, October 15 -19, 2018.
6. Joint 19th International Heat Pipe Conference and 13th International Heat Pipe Symposium, Pisa, Italy, June 2018.
7. 24th National Heat and Mass Transfer Conference and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference, December 2017.
8. Joint 18th International Heat Pipe Conference and 12th International Heat Pipe Symposium, Jeju, Korea, June 2016.
9. One day workshop, Commercializing Intellectual Capital, Muscat, Oman, April 17, 2016.
10. One day workshop, Industry Academia Collaboration, PSIT, Kanpur, April 15, 2016.
11. 1st International Symposium on Interfacial Phenomena and Heat Transfer, Kutateladze Institute of Thermophysics, Novosibirsk, Russia, March 02-04, 2016.
12. 23rd National Heat and Mass Transfer Conference and 1st International ISHMT-ASTFE Heat and Mass Transfer Conference, December 17-20, 2015, Thiruvananthapuram, India.
13. Indo-German Workshop on Modeling and Measurement Techniques for Microscale flows, Chennai, India, February 23-25, 2015.
14. 5th International and 41st National Conference on Fluid Mechanics and Fluid Power, FMFP-2014, IIT Kanpur, Kanpur, India, December 12-14, 2014.
15. 4th ASME Micro/Nanoscale Heat and Mass Transfer International Conference, MNHMT-14, Hong Kong, China, December 11-14, 2013.
16. 17th International Heat Pipe Conference, Kanpur, India, October 14-17, 2013.
17. 1st International Conference on Wetting and Evaporation, Marseilles, France, June 17-20, 2013.
18. International Heat Pipe Committee Meeting, Lyon, France, March 20-23, 2011.
19. Advanced Materials and Delivery Devices, Two day workshop organized by Department of Science and Technology (IRHPA project groups), IIT Bombay, India, February 24-25, 2013.
20. 39th National Conference on Fluid Mechanics and Fluid Power, December 13-15, 2012, SVNIT Campus, Surat, India.
21. 8th International Conference on Boiling and Condensation, Lausanne, Switzerland, June 3-7, 2012.
22. 16th International Heat Pipe Conference, Lyon, France, May 20-24, 2012.
23. International Workshop on Phase-change Thermal Systems, Kanpur, India, March 19-20, 2012.
24. 10th International ASME-ISHMT Heat and Mass Transfer Conference, Chennai, India, December 27-20, 2011.
25. International Heat Pipe Committee Meeting, Lyon, France, October 2011.
26. 8th Minsk International Heat Pipe Seminar, Minsk, Belarus, September 2011.

27. 7th International Conference on Computational Heat and Mass Transfer, Istanbul, Turkey, July 2011.
28. 21st International Symposium on Transport Phenomena, Kaohsiung City, Taiwan ROC, November 02-05, 2010.
29. Theme Meeting on Thermal Hydraulics of Nuclear Reactors - 2010, IGCAR Kalpakkam, India, February 18-19, 2010.
30. 9th International ASME-ISHMT Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.
31. International Heat Pipe Committee Meeting, Noordwijk, The Nederlands, October 2009.
32. 24th SPIC-MACAY National Convention, Thiruananthapuram, India, May 24-29, 2009.
33. 9th International Heat Pipe Symposium, Kuala Lumpur, Malaysia, November 17-20, 2008.
34. 7th Minsk International Heat Pipe Seminar, Minsk, Belarus, September 2008.
35. Annual Research Review Seminar, GDR-SYREDI: Two-phase thermal management systems network meeting, Toulouse, France, July 2008.
36. 2nd Joint NTUS-IITK Workshop in Mechanical, Aerospace and Industrial Engineering, Kanpur, India, April 2008.
37. 8th ASME/ISHMT International Heat and Mass Transfer Conference, Hyderabad, India, 2008.
38. International Workshop on Nuclear Thermal-Hydraulics, BARC, Mumbai, India, 2008.
39. 1st Joint NTUS-IITK Workshop in Mechanical, Aerospace and Industrial Engineering, Singapore, July 2007.
40. 14th International Heat Pipe Conference, Florianópolis, Brazil, April 2007.
41. Research and Challenges (REACH) Symposium, Parwanoo (HP), India, March 2007.
42. 7th ASME/ISHMT Heat and Mass Transfer Conference, Guwahati, India January 2006.
43. Introduction to Fuel Cell Technology, two day workshop at IIT Guwahati, India, January 2006.
44. 13th International Heat Pipe Conference, Keynote Speaker, Shanghai, China, November 2004.
45. 5th Minsk International Heat Pipes Seminar, Minsk, Belarus, September 2003.
46. Annual Thermodynamic Colloquium, Verein Deutscher Ingenieure, Wernigerode, Germany, October 2002.
47. 12th International Heat Transfer Conference, Grenoble, France, August 2002.
48. 3rd International Conference on Transport Phenomenon in Multiphase Systems, Kielce, Poland, June 2002.
49. 5th ASME/ISHMT Heat & Mass Transfer Conference, Kolkata, India, January 2002.
50. Hydrogen Energy Technology Workshop - IIT, Chennai, India, December 2001.
51. 6th International Heat Pipe Symposium, Chiang Mai, Thailand, November 2000.
52. Vehicle Emissions and Control Technologies Workshop - IIT, Kanpur, India, July 1999.
53. NACOMM'93 - National Conference on Machines and Mechanisms, IIT, Kharagpur, India, December 1993.
54. MECHVIBES'93 - National Mechanical Engineering Seminar, REC Kurukshetra, India, April 1993.
55. National Seminar: Preserve Planet Earth, Institution of Engineers, Jabalpur, India, October 1993.

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