

# Curriculum Vitae

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**Name** Sameer Khandekar  
**Date of Birth** November 10, 1971 (Jabalpur MP, India)  
**Nationality** Indian  
**Designation** Sir M. Visvesvaraya Chair Professor (May 2017)  
Professor (since June 2014)  
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  
Tel: +91-512-259-7038, Fax: +91-512-259-7408  
E-mail: [samkhan@iitk.ac.in](mailto:samkhan@iitk.ac.in); Web: <http://home.iitk.ac.in/~samkhan>

## 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<sup>2</sup> 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. This data was used for the model validation and subsequent fine tuning.

- 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**

- Microscale/ Two-phase heat transfer, Heat Pipes and Thermosyphons, Energy systems.
- Innovation and Entrepreneurship

## **Academic achievements - Timeline**

- Sir M. Visvesvaraya Chair Professor, IIT Kanpur, May 2017 (Three Years).
- Awarded the Fellowship of the Institute of Engineers India, 2016.
- Doctoral thesis of Mauro Mameli awarded the best thesis by 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 undergraduate 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**

- *Heat Pipe Science and Technology: An International Journal*, Begell House Inc., USA.
- *Interfacial Phenomena and Heat Transfer*, 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, June-July, 2018 (four weeks).
- Research + Teaching visit to University of Pisa, Italy, May-June, 2018 (Seven 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 visit sponsored by CEFIPRA/IFCPAR, CETHIL, INSA-Lyon, France
  - June 2018 (1 week)
  - September 2015 (2 weeks)
  - June 2015 (2 weeks)
  - September 2014 (3 weeks).
  - November 2013 (3 weeks).
- 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**

- 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**

- 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 (in association with Dr. Vishwas Wadekar), 30 participants, pre-conference course (ISHMT-2017), 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 during M. Tech. Program at IIT Kanpur

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

## **M. Tech. theses advising**

- Completed: 46 (06 as co-advisor)
- Ongoing students: 03

## **Ph.D. theses advising**

- **Completed: 04**

- Balkrishna Mehta: Local Convective Thermal Transport in Single-/Two-Phase Non-Pulsating and Pulsating Flows in Square Mini-channels, 2014.
- Basant Singh Sikarwar: Modeling Dropwise Condensation underneath Inclined Textured Surfaces (as co-advisor in association with Dr. K. Muralidhar), 2013.
- Manoj Kumar Moharana: Thermo-hydrodynamics of Internal Convective Flows in Mini-/Micro channels, 2012.
- Mauro Mameli: Pulsating Heat Pipes: Numerical Modeling and Experimental Assessment, University of Bergamo, Italy (as co-advisor in association with Dr. Marco Marengo), 2011.

- **Thesis Submitted (Under Review)**

- Vyas Srinivasan: Thermo-hydrodynamics of Isolated Taylor Liquid Plugs, April 2018.

- **Ongoing students: 06**

Topic 1: Condensation studies for passive cooling applications.

Topic 2: Passive hydrogen/steam management during severe nuclear accidents.

Topic 3: Loop heat pipes for terrestrial and avionics applications

Topic 4: Dynamics of droplet coalescence (as co-advisor in association with Dr. K. Muralidhar)

Topic 5: Transport phenomena in ferrofluids

Topic 6: Droplet dynamics and evaporation on textured surfaces

## **Sponsored Research Projects**

### **Ongoing (04)**

#### **1. 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, are developing Loop Heat Pipes for avionics and terrestrial application (nominal power = 60 W)

#### **2. 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 in the project is to develop specialized wicks for loop heat pipe application.

#### **3. Local heat transfer coefficient during film condensation of steam hydrogen mixtures**

*Sponsoring agency: Board of Research in Nuclear Sciences*

*Time schedule: ongoing since February 2015 (three years)*

*Role: Principle investigator*

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

#### **4. 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: Principle investigator*

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

### **Completed (13)**

#### **1. Development of integrated heat pipe based passive thermal management platform with stress free mountings**

*Sponsoring agency: Indian Space Research Organization*

*Time schedule: 02 years (May 2015 – April 2017)*

*Role: Principle Investigator*

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

#### **2. 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 coalescence 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.

### **3. 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.

### **4. Development of pulsating heat pipe passive heat exchangers for nuclear engineering applications**

*Sponsoring agency: Bhabha Atomic Research Center, Government of India*

*Time schedule: ongoing since January 2009; Term - 3 years*

*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.

### **5. Micro-devices for process applications**

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

*Time schedule: ongoing since April 2007; Term - 3 years*

*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 a number of 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.

### **6. Development of internet based experiments (Pilot Phase Project)**

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

*Time schedule: April 2009-March 2012; Term - 3 years*

*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.

## **7. Design of heat transfer module for a specified control volume using heat pipes**

*Sponsoring agency: IRDE (DRDO), Dehradun*

*Time schedule: 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.

## **8. 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.

## **9. 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.

## **10. Dropwise condensation over an inclined plate subjected to a vapor flux**

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

*Time schedule: 03+01 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.

## **11. 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).

## **12. 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.

## **13. 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<sup>2</sup>), 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. **Thermo-Hydrodynamics of Isolated Taylor Plug Flows**, Institute of Thermophysics, Russian Academy of Sciences, Novosibirsk, Russia, December 13, 2017.
2. **Understanding Pulsating Heat Pipes: The Way Ahead**, 1<sup>st</sup> International Symposium on Interfacial Phenomena and Heat Transfer, Novosibirsk, Russia, March 02-04, 2016.
3. **Local Thermo-hydrodynamics of Taylor Flows in the context of Pulsating Heat Pipes**, Indo-German Workshop on Modeling and Measurement Techniques for Microscale flows, Chennai, India, February 23-25, 2015.
4. **Dropwise Condensation over Textured Surfaces: Influence of Drop Shape and Coalescence** (authored by Somvanshi P, Muralidhar K., and Khandekar S.), International Heat Transfer Conference, IHTC-15, Kyoto, Japan, August 2014 (presented by Prof. K. Muralidhar).
5. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes**, Paper # MNHMT2013-22088, 4th Micro/Nanoscale Heat and Mass Transfer International Conference, Hong Kong, China, December 12, 2013.
6. **Dropwise Condensation on Textured Surfaces: Progress and Prospects**, Institute P'Prime, ENSMA (l'Ecole Nationale Supérieure de Mécanique et d'Aérotechnique), Poitiers, France, November 21, 2013.
7. **Pulsating Heat Pipe: An Overview**, delivered to all the graduate students of Center for Thermal Sciences (CETHIL), INSA Lyon, France, June 2012.
8. **Hierarchical Modeling of Dropwise Condensation Process**, Institute lecture delivered at the INSA Lyon, France, July 2012.
9. **Dropwise Condensation on Horizontal Substrates with and without a Wettability Gradient**, 8th Minsk International Seminar (Heat Pipes, Heat Pumps, Refrigeration and Energy Systems), Minsk, Belarus, September 12-15, 2011.
10. **Pulsating Heat Pipe Heat Exchangers**, Proc. 21<sup>st</sup> International Symposium on Transport Phenomena, Kaohsiung City, Taiwan ROC, November 02-05, 2010.
11. **Dropwise Condensation on Textured Surfaces: Issues and Prospects**, Proc. 9<sup>th</sup> International ASME-ISHMT Heat and Mass Transfer Conference, Mumbai, India, January, 2010.
12. **Roadmap to Realistic Modeling of Closed Loop Pulsating Heat Pipes**, Proc. 9<sup>th</sup> International Heat Pipe Symposium, Kuala Lumpur, Malaysia, November, 2008.
13. **Multiple Steady States of a Pulsating Heat Pipe**, 7<sup>th</sup> Minsk International Seminar (Heat Pipes/Heat Pumps/Refrigerators/Power Systems), Minsk, Belarus, September 2008.
14. **Phase-Change Heat Transfer Activities at IIT Kanpur**, CETHIL, Center of Thermal Sciences, INSA de Lyon, France, May 2008.
15. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes**, Chiang Mai University, Thailand, September 2006.
16. **Emerging Importance of Microscale Heat Transfer**, Federal University of Santa Catarina, Florianopolis, Brazil, June 2005.
17. **Closed and Open Loop Pulsating Heat Pipes**, Proc. 13<sup>th</sup> International Heat Pipe Conference, Shanghai, China, 2004.
18. **State of the Art on Pulsating Heat Pipes**, Proc. 2<sup>nd</sup> ASME International Conference on Minichannels and Microchannels, Rochester (NY), USA, 2004.
19. **On the Definition of Pulsating Heat Pipes: An Overview**, Proc. 5<sup>th</sup> Minsk International Conference (Heat Pipes, Heat Pumps and Refrigerators), Minsk, Belarus, 2003.
20. **Pulsating Heat Pipes: Progress and Prospects**, Proc. 3<sup>rd</sup> International Conference on Energy and Environment, Vol. 1, pp. 723-730, Shanghai, China, 2003.

## National

### **On Innovation and Entrepreneurship:**

1. **Elements of TBI Infrastructure and Challenges**, UP Start-up Conclave, Kanpur, March 18-19, 2017.
2. **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.
3. **Building up the Tinkering, Innovation and Entrepreneurship Eco-system**, One-Day Workshop, MVJ College of Engineering, Bangalore, September 23, 2016.
4. **Skill Development of Young Engineers** (Theme Speaker), 49<sup>th</sup> Engineers' Day Celebration, Institution of Engineers (India) in association with INAE/IEEE/IETE Kanpur Chapter, Kanpur, September 16, 2016.
5. **Ifs and Buts of Entrepreneurship as a Career Option**, SURGE popular lecture series, IIT Kanpur, June 22, 2016.
6. **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.
7. **Industry-Academia Partnership: Challenges and Opportunities**, One day workshop, PSIT Kanpur, April 15, 2016.

### **On technical research:**

8. **Transport Phenomena and Thermodynamics**, Moradabad Institute of Technology, Moradbad, under the Faculty Development Program on Thermal Engineering, APJ Abdul Kalam Technical University, Uttar Pradesh, May 01, 2017.
9. **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.
10. **Heat Pipes in Contemporary Thermal Management Strategies**, TEQIP sponsored short term course, Government College of Engineering Amravati (MS), July 20, 2016.
11. **Microscale Fabrication Technologies in Thermal Engineering**, Workshop on Micro & Nano Fabrication, Short Term Course, IIT Kanpur, March 16-20, 2015.
12. **What can I do?** Inspirational talk at Council for Science and Technology (CST-UP), Lucknow, Uttar Pradesh, 2015.
13. **Understanding Thermo-hydrodynamics of Pulsating Heat Pipes**, TEQIP sponsored short term course on Microscale and Nanoscale Heat Transfer, PESIT, Bangalore, December 26-27, 2013.
14. **Applications of Micro-/miniature Manufacturing in Thermal-Fluid Engineering**, National Symposium on Miniature Manufacturing in 21st Century, IIT-BHU Campus, August 16-18, 2013.
15. **Status of Contemporary Energy Usage Pattern**, National Conference: ENERGIZE 2011, organized by Gyan Ganga Institute of Technology, Jabalpur (MP), India, February 18, 2011.
16. **Learning through Real and Virtual Experiments**, Institute Lecture, Rajeev Gandhi Institute of Petroleum Technology, Rai Bareilly, January 2010.
17. **Internet based Real Time Experiments**, Institute Lecture, IIT Kanpur, October 2009.

18. **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.
19. **Non-Intrusive Temperature Measurement Techniques**, QIP short-term course titled Modern Experimental Techniques in Mechanics of Fluids and Solids, IIT Kanpur, May 2007.
20. **World Energy Resources: Status and Perspectives**, QIP short term course, IIT Kanpur (Course coordinator: Dr. B. P. Pundir), May 2007.
21. **Introduction to Transport Phenomena**, Short Term Refresher Course, Instrument Research and Development Establishment (DRDO), Dehradun, November 2006.
22. **Transport Phenomena in Nanofluids**, QIP short term course on Recent Trends in Advanced Composites (Course coordinator: Dr. J. Ramkumar), November, 2006.
23. **Opportunities for Interdisciplinary Research in Energy Technology**, National Conference of Electrical and Mechanical Engineering, Guru Ramdas Khalsa Institute of Technology, Jabalpur (MP), March 2006.
24. **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

- **Device and Method for Nano-polishing of inner surface of tubes of varying cross section:** Patent filed, 201611025761 July 2016.
- **Shape Memory Alloy (SMA) wire as sensor for Taylor Bubble flow regime of two-phase flows:** Patent filing in progress (March 2015).
- **Unsteady wall heat flux sensor for extreme applications**  
Provisional Patent filed ID: 3977/DEL/2014, December 2014.
- **Compact Air Cooler with Nano- Structured Surfaces**  
Provisional Patent filed ID: 3246/DEL/2014, November 2014.
- **Bicycle Mounted Solar Energy Harvesting Unit,**  
Provisional Patent filed ID: 2420/DEL/2014, August 2014.
- **Nano-porous Microtubes for Heat and Mass Exchange Applications,**  
Provisional Patent filed ID: IN/875089, November 2013 <Commercialized>.

### Book/Book chapter/ Book Adaptation

#### • Books

1. 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.
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34. Mauro Mameli M., Khandekar S. and Marengo M., **Are Dominant Oscillation Frequencies Always Present in Pulsating Heat Pipes?**, Proc. 7th International Symposium on Two-phase Systems for Ground and Space Applications, Beijing, China, September 17-22, 2012.

35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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.
43. 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.
44. 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.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. 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.
51. Sikarwar B., Muralidhar K. and Khandekar S., **Flow and Thermal Fields in a Pendant Droplet Moving on a Lyophobic Surface**, Proc. 14<sup>th</sup> International Heat Transfer Conference, Washington DC, USA, August 8-13, 2010.

52. Mehta B. and Khandekar S., **Effect of Periodic Pulsations on Heat Transfer in Simultaneously Developing Laminar flows: A Numerical Study**, Proc. 14<sup>th</sup> International Heat Transfer Conference, Washington DC, USA, August 8-13, 2010.
53. Das S. P., Lefevre F., Bonjour J. and Khandekar S., **Parametric Study of a Two-phase Oscillating Flow in a Capillary Tube**, Proc. 15<sup>th</sup> International Heat Pipe Conference (IHPC), Clemson, USA, April 25-30, 2010.
54. Tripathi A., Khandekar S. and Panigrahi P. K., **Oscillatory Contact Line Motion Inside Capillaries**, Proc. 15<sup>th</sup> International Heat Pipe Conference (IHPC), Clemson, USA, April 25-30, 2010.
55. Sonawane Y. R., Khandekar S., Mishra B. K., SoundraPandian K. K., **Environment Monitoring and Control of a Polyhouse Farm through Internet**, Proc. 23<sup>rd</sup> National Convention of Agriculture Engineers and National Seminar on Agricultural Mechanization through Entrepreneurial Development, Rahuri, Ahmednagar (MS), India, February 6-7, 2010.
56. Agarwal G., Moharana M. K. and Khandekar S., **Thermo-hydrodynamics of Developing Flow in a Rectangular Mini-channel Array**, Proc. 20<sup>th</sup> National and 9<sup>th</sup> International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.
57. Battoo N. K., Khandekar S. and Muralidhar K., **Mathematical Simulation of Dropwise Condensation Exposed to Vapor Flux**, Proc. 20<sup>th</sup> National and 9<sup>th</sup> International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.
58. Sikarwar B., Muralidhar K. and Khandekar S., **Flow and Heat Transfer in a Pendant Liquid Drop Sliding on an Inclined Plane**, Proc. 20<sup>th</sup> National and 9<sup>th</sup> International ISHMT-ASME Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.
59. Shekhavat Y. S., Khandekar S. and Panigrahi P. K., **Hydrodynamic Study of an Oscillating Meniscus in a Square Mini-Channel**, Proc. 2<sup>nd</sup> Micro/Nanoscale Heat and Mass Transfer International Conference, Shanghai, China, December 18-21, 2009.
60. Hemadri V. and Khandekar S., **Thermal Performance Characterization of Embedded Pulsating Heat Pipe Radiators by Infrared Thermography**, Proc. 6<sup>th</sup> International Symposium on Multiphase Flow, Heat Mass Transfer and Energy Conversion, Xian, China, July 11-15, 2009.
61. Moharana M. K., Nageswara Rao P., Khandekar S. and Kunzru D., **Producing Hydrogen from Ethanol in a Microfuel Processor: Recent Developments and Challenges**, Proc. 6<sup>th</sup> International Symposium on Multiphase Flow, Heat Mass Transfer and Energy Conversion, Xian, China, July 11-15, 2009.
62. Khandekar S. and Groll M., **Roadmap to Realistic Modeling of Closed Loop Pulsating Heat Pipe**, Proc. 9<sup>th</sup> International Heat Pipe Symposium, Kuala Lumpur, Malaysia, November 17-20, 2008.
63. Rao M. and Khandekar S., **Thermo-hydrodynamics of developing flows in a mini-channel array: Liquid crystal thermography and numerical study**, Proc. 8<sup>th</sup> ASME/ISHMT International Heat and Mass Transfer Conference, Hyderabad, India, 2008.
64. Khandekar S. and Gupta A., **Embedded Pulsating Heat Pipe Radiators**, Proc. 14<sup>th</sup> International Heat Pipe Conference (IHPC), Florianópolis, Brazil, April 22-27, 2007.
65. Mehta B. and Khandekar S., **Two-phase Closed Thermosyphon with Nanofluids**, Proc. 14<sup>th</sup> International Heat Pipe Conference (IHPC), Florianópolis, Brazil, April 22-27, 2007.
66. Khandekar S. and Groll M., **Insights into the Performance Modes of Closed Loop Pulsating Heat Pipes and Some Design Hints**, Proc. 7<sup>th</sup> ASME/ISHMT Joint International Conference, IIT Guwahati, January 2006.
67. Khandekar S., Manyam S., Groll M. and Pandey M., **Two-phase Flow Modeling of Closed Loop Pulsating Heat Pipes**, Proc. 13<sup>th</sup> International Heat Pipe Conference, Shanghai, China, 2004.
68. Yang H., Khandekar S. and Groll M., **Operational Characteristics of Flat Plate Closed Loop Pulsating Heat Pipes**, Proc. 13<sup>th</sup> International Heat Pipe Conference, Shanghai, China, 2004.
69. 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. 13<sup>th</sup> International Heat Pipe Conference, Shanghai, China, 2004.
70. Khandekar S., Welte T. and Groll M., **Thermal Management of 3D Microelectronic Modules - Experimental and Simulation Studies**, Proc. 12<sup>th</sup> International Heat Pipe Conference, pp. 384-389, Moscow, Russia, 2002.
71. Khandekar S., Cui X. and Groll M., **Thermal Performance Modeling of Pulsating Heat Pipes by Artificial Neural Network**, Proc. 12<sup>th</sup> International Heat Pipe Conference, pp. 215-219, Moscow, Russia, 2002.

72. Khandekar S., Groll M., Charoensawan P. and Terdtoon P., **Pulsating Heat Pipes: Thermo-fluidic Characteristics and Comparative Study with Single Phase Thermosyphon**, Proc. 12<sup>th</sup> International Heat Transfer Conference, ISBN-2-84299-307-1, Vol. 4, pp. 459-464, Grenoble, France, 2002.
73. Khandekar S., Groll M. and Luckchoura V., **An Introduction to Pulsating Heat Pipes**, Electronics Cooling Magazine, Vol. 9, Issue 2, pp. 38-41.
74. 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.
75. Khandekar S. and Jhinge P., **Control of Condenser Unit Subsystem with a Microprocessor**, MECHVIBES'93, Regional Engineering College, Kurukshetra, India, 1993.
76. 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**

International Journal of Heat and Mass Transfer, ASME Journal of Heat Transfer, International Journal of Thermal Sciences, Applied Thermal Engineering, Experimental Thermal and Fluid Sciences, Heat Transfer Engineering, AIAA Journal of Thermophysics and Heat Transfer, 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**

### Institute activity:

*Ongoing*

*None, at present.*

### *Completed*

- Associate Dean (Innovation and Incubation) and Coordinator: SIDBI Innovation & Incubation Center, IIT Kanpur September 2015 - November 2017.
- Member of 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.
- 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 8<sup>th</sup> 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.



### Departmental activity:

#### *Ongoing*

- Member of NET Post Graduate Committee from September 2015 - ongoing.
- Coordinator of the Refrigeration/AC Laboratory w. e. f. August 2005 - ongoing.
- Coordinator of the Safety Committee, August 2014 – ongoing.
- Coordinator of Teaching and Research Assistant Management Committee, August 2017 – ongoing.

#### *Completed*

- 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 responsibilities

- **President**, Shiksha-Sopan, 2005-2008; 2013-ongoing
- **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.
- **Faculty Advisor**, Maharashtra Mandal, IIT Kanpur.
- **Faculty Advisor**, Vivekananda Youth Convention, IIT Kanpur, January 15-16, 2011.

### Coordination of short term courses/workshops/conferences

1. **Conclave Co-Coordinator**, UP Startup Conclave: Entrepreneurship & Innovation in Academic Institutions: Challenges and Opportunities, March 18-19, 2017, in association with TEQIP/SPFU, UP.
2. **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.
3. **Chairman**, 17<sup>th</sup> International Heat Pipe Conference, 40<sup>th</sup> year jubilee conference, Kanpur, India, October 14-17, 2013.
4. **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.

5. **Workshop Co-Convener** - One-Day Workshop on *Virtual Laboratories*, IIT Kanpur, February 04, 2012 (in association with Dr. Kantesh Balani).
6. **Mentor (Guru)**, USID *Gurukul* - International Winter School for Participatory, Collaborative and Immersive Learning Experience (<http://www.usidfoundation.org>), November 26 - December 11, 2011.
7. **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).
8. **Co-Chairman**: Golden Jubilee Energy Conclave 2010: Eight Day Workshop Series on *Energy*, January 08-15, 2010.
9. **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).
10. **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.
11. **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 19<sup>th</sup> International Heat Pipe Conference and 13<sup>th</sup> International Heat Pipe Symposium, Pisa, Italy, June 2018.
2. 24<sup>th</sup> National Heat and Mass Transfer Conference and 2<sup>nd</sup> International ISHMT-ASTFE Heat and Mass Transfer Conference, December 2017.
3. Joint 18<sup>th</sup> International Heat Pipe Conference and 12<sup>th</sup> International Heat Pipe Symposium, Jeju, Korea, June 2016.
4. One day workshop, Commercializing Intellectual Capital, Muscat, Oman, April 17, 2016.
5. One day workshop, Industry Academia Collaboration, PSIT, Kanpur, April 15, 2016.
6. 1<sup>st</sup> International Symposium on Interfacial Phenomena and Heat Transfer, Kutateladze Institute of Thermophysics, Novosibirsk, Russia, March 02-04, 2016.
7. 23<sup>rd</sup> National Heat and Mass Transfer Conference and 1<sup>st</sup> International ISHMT-ASTFE Heat and Mass Transfer Conference, December 17-20, 2015, Thiruvananthapuram, India.
8. Indo-German Workshop on Modeling and Measurement Techniques for Microscale flows, Chennai, India, February 23-25, 2015.
9. 5<sup>th</sup> International and 41<sup>st</sup> National Conference on Fluid Mechanics and Fluid Power, FMFP-2014, IIT Kanpur, Kanpur, India, December 12-14, 2014.
10. 4<sup>th</sup> ASME Micro/Nanoscale Heat and Mass Transfer International Conference, MNHMT-14, Hong Kong, China, December 11-14, 2013.
11. 17<sup>th</sup> International Heat Pipe Conference, Kanpur, India, October 14-17, 2013.
12. 1<sup>st</sup> International Conference on Wetting and Evaporation, Marseilles, France, June 17-20, 2013.
13. International Heat Pipe Committee Meeting, Lyon, France, March 20-23, 2011.
14. 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.
15. 39<sup>th</sup> National Conference on Fluid Mechanics and Fluid Power, December 13-15, 2012, SVNIT Campus, Surat, India.
16. 8<sup>th</sup> International Conference on Boiling and Condensation, Lausanne, Switzerland, June 3-7, 2012.
17. 16<sup>th</sup> International Heat Pipe Conference, Lyon, France, May 20-24, 2012.
18. International Workshop on Phase-change Thermal Systems, Kanpur, India, March 19-20, 2012.
19. 10<sup>th</sup> International ASME-ISHMT Heat and Mass Transfer Conference, Chennai, India, December 27-20, 2011.
20. International Heat Pipe Committee Meeting, Lyon, France, October 2011.
21. 8<sup>th</sup> Minsk International Heat Pipe Seminar, Minsk, Belarus, September 2011.
22. 7<sup>th</sup> International Conference on Computational Heat and Mass Transfer, Istanbul, Turkey, July 2011.
23. 21<sup>st</sup> International Symposium on Transport Phenomena, Kaohsiung City, Taiwan ROC, November 02-05, 2010.
24. Theme Meeting on Thermal Hydraulics of Nuclear Reactors - 2010, IGCAR Kalpakkam, India, February 18-19, 2010.
25. 9<sup>th</sup> International ASME-ISHMT Heat and Mass Transfer Conference, Mumbai, India, January 4-6, 2010.
26. International Heat Pipe Committee Meeting, Noordwijk, The Netherlands, October 2009.

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

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