Newsletter
Department of Mechanical Engineering
February 2019

From the Director's Desk…

Dear Reader,

I am delighted to introduce this fourth edition of the Mechanical Department Newsletter. We intend to maintain this regular publication and to use it to keep you in touch with news and developments related to the Department of Mechanical Engineering, School of Technology (SOT).

I take this opportunity to congratulate the editorial team for bringing out this newsletter, which in itself is an achievement considering the effort and time required. May all our students, staff and faculty soar high in uncharted skies and bring glory to the world and their profession with the wings of education.

Dr. T.P. Singh
Director
School of Technology

From the Head of the Department's Desk…

It gives me immense pleasure to share newsletter of the Mechanical Engineering dept., February 2019. Mechanical Engineering Dept. is the most happening dept. of the School Of Technology. Newsletter gives an overview of the activities carried out by students, staff and faculties during the month. You may please share your feedback, comments & suggestions to the coordinators.

Dr Vishvesh Badheka
HOD, Mehcanical Engineering
School of Technology

Publications

Journals

Dr Pavan Kumar Gurrala, Dr Vivek K Patel and Dr Vivek Patel *published following Journals during February 2019:*

1. *"Deep Bhalodi, Karan Zalavadiya and* ***Pavan Kumar Gurrala.*** *""Influence of temperature on polymer parts manufactured by fused deposition modeling process."" Journal of the Brazilian Society of Mechanical Sciences and Engineering, Vol. 41 No. 3 (2019). https://doi.org/10.1007/s40430-019-1616-z"*

2. ***Patel, V.K.*** *and Raja, B.D., 2019. A comparative performance evaluation of the reversed Brayton cycle operated heat pump based on thermo-ecological criteria through many and multi objective approaches. Energy Conversion and Management, 183, pp.252-265*

3. ***Patel, V.,*** *W.Y. Li, G. Wang, F. Wang, A. Vairis, and P. Niu. Friction Stir Welding of Dissimilar Aluminum Alloy Combinations: State-of-the-Art. Metals 2019, 9, 270.*

Publications

Conferences

Dr Vivek K Patel published following conference papers during February 2019:

1. *Mansuriya, K. and **Patel, V.K**. 2019. Thermodynamic Optimization of Ejector Refrigeration System. 12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar.*

2. *Patel, P.A., **Patel, V.K.** and Mudgal A. 2019. Effect of Initial PH And Applied Current Density On Removal Efficiency of Cod of Coking Wastewater From Gasifier Plants. 12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar.*

3. *Ginoya, A., **Patel, V.K**. and Mudgal A. 2019. Thermodynamic Optimization of Stirling Heat Engine With Methane Gas Using Finite Speed Thermodynamic Model. 12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar.*

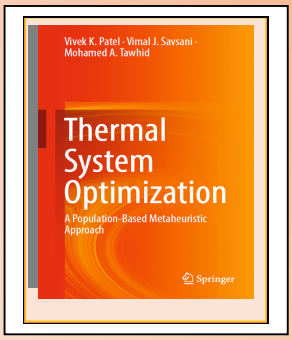
4. *Thacker S. and **Patel, V.K.** 2019. Thermal-Hydraulic Optimization of a Nanofluid Based Microchannel Heat Sink. 12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar."."*

Publications

Book

Dr Vivek K Patel *published the following book in February 2019*

- ***Patel, V.K.****, Savsani, V.J. and Tawhid, M.A. "Thermal System Optimization: A Population-Based Metaheuristic Approach". 2019, Springer.*



Book Chapters

Dr Vivek Patel and Dr Pankaj Sahlot *published the following book chapter in February 2019*

Patel, V.*, W.Y. Li, Q. Wen, Y. Su, and N. Li. Homogeneous Grain Refinement and Ductility Enhancement in AZ31B Magnesium Alloy Using Friction Stir Processing, in Magnesium Technology 2019, Springer International Publishing: Cham, 2019; 83-87 pp.*

Patel, V.*, W.Y. Li, Q. Wen, Y. Su, and N. Li. Stationary Shoulder Friction Stir Processing: A Low Heat Input Grain Refinement Technique for Magnesium Alloy, in Friction Stir Welding and Processing X, Springer International Publishing: Cham, 2019; 209-215 pp.*

Sahlot, Pankaj; *Mishra, R. S. and Arora, Amit, "Wear mechanism for H13 steel tool during friction stir welding of CuCrZr alloy", in Friction Stir Welding and Processing X, Springer, pp. 59-64, Feb. 2019,*

Expert Lectures Delivered

- ***Dr Vishvesh Badheka*** *delivered Expert Lecture on Advances in solid state welding process, during Recent advances in Modern Manufacturing Processes 2019 (RAMMP 2019) workshop held on 7-8th Feb 2019 at PDPU.*

- ***Dr Vishvesh Badheka*** *delivered Expert Lecture on Advance in Welding Processes, during one-day GUJCOST sponsored seminar on 21st Feb 2019 (Thursday) at DJMIT*

One- Day GUJCOST Sponsored Seminar at DJMIT

- ***Dr Vivek K Patel*** *delivered an Expert talk on many-objective heat transfer search algorithm at STTP on "Multi-Objective Optimization: Theory and Applications" held at Vishwakarma Government Engineering College (VGEC) Ahmedabad*

- ***Dr Vishvesh Badheka*** *delivered expert sessions on following during 86th Training & Certification programme for IWE / IWT course on 28th Feb 2019at IIW Branch office, Baroda*
  - *Introduction to Wear and Surfacing*
  - *Structure, Properties, Heat treatment & Testing of welded joints.*

86th Training & Certification Programme for IWE/IWT Course

Events Arranged

Dr S.S Kachhwaha *convened the 12th International Conference on Thermal Engineering: Theory & Applications organized by Mechanical Department in collaboration with Ryerson University, Toronto, Canada from 23-26th Feb 2019.* ***(Report 1)***

An Interactive session with International Delegates and 3rd year students of Mechanical Engineering was coordinated by ***Dr Vishvesh Badhka and Mr Parth Prajapati.*** *Professors gave their insights about higher studies and future prospects of thermal engineering and their importance in mechanical engineering* ***(Report 2)***

Events Arranged

Dr Vishvesh Badheka *arranged an Interactive discussion on Petroleum Conservation Research Association (PCRA).*
A brief seminar was delivered by Mr. Chirag Chauhan and other officials of Indian Oil Corporation Limited (IOCL) on importance and need of Energy conservation and also gave some aspect of renewable energy ***(Report 3)***

Interactive Discussion on
Petroleum Conservation Research Association (PCRA)

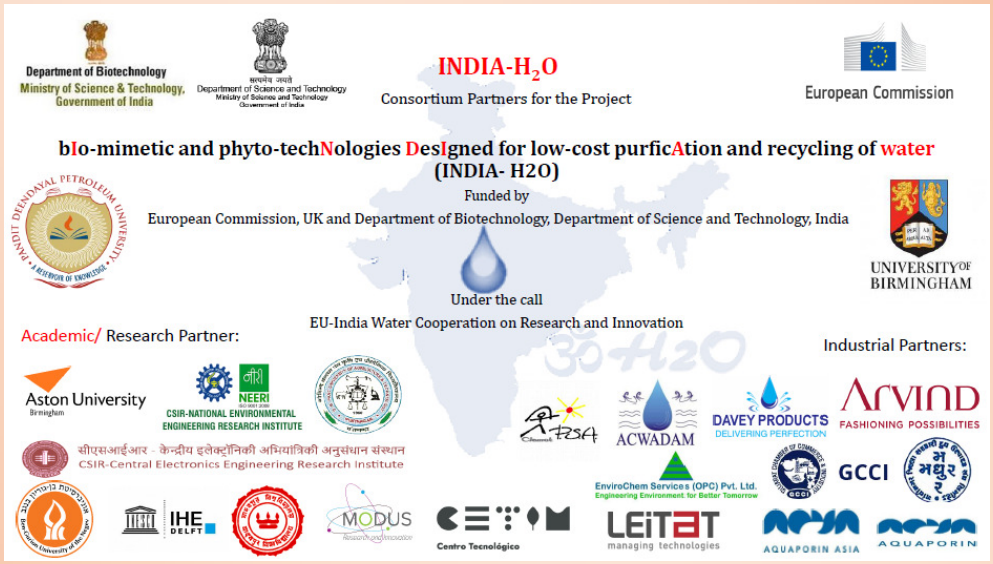
Dr Vishvesh Badheka *conducted Custom made one full day workshop on "Metallurgy for Non Metallurgist" for officials of Kalpataru Power Ltd, Gandhinagar on 15th Feb 2019. Twelve officials attended the program. In addition to basic metallurgy, metallurgy of Galvanise steel and effect of various bending and cutting operations on metallurgy of Galvanise steel were covered.*

Workshop on "Metallurgy for Non Metallurgist" for officials of Kalpataru Power Ltd, Gandhinagar

Events Arranged

The INDIA-H2O Kick Off Meeting was hosted by ***Dr Anurag Mudgal****,* ***Dr Jatin Patel and Dr Vivek Patel,*** *Mechanical Dept, Pandit Deendayal Petroleum University, in Gandhinagar, Gujarat.*

*This gave all the partners the opportunity to meet each other, and discuss our aims in detail. This week long meeting allowed all consortium partners to visit multiple sites over the state of Gujarat, including some of the industrial sites such as Arvind, GCCI and Madhur Dairy.****(Report 4)***



Conference & Meetings

Dr Vishvesh Badheka *attended the following Workshops and Meetings during February 2019*

- *AWS Lecture Series IX Mr. Brian Gaal (Advisor AWS subcommittees on A5B, G2C, G2E and A5A groups) on Welding of Nickel & Nickel Alloys organised by IIW Baroda Br on 5th Feb 2019*

- *Workshop on Industry-University collaborations for PDPU organised by Institute for Manufacturing, University of Cambridge and BP, held on 6-7th Feb 2019 at PDPU.*

- *Research Advisory Board (RAB) meeting (Invitee) held on 26th Feb 2019 and presented ongoing research activities of the mechanical engineering debarment.*

Dr Vivek K Patel *attended the following Conference and meeting during February 2019*

- *12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar.*

- *Acted as a session chair for 12th International Conference on Thermal Engineering: Theory and Applications, 23-26 February, PDPU, Gandhinagar.*

- *Kickoff meeting for India-H2O project entitle ""bio-mimetic and phyto-technologies Designed for low-cost purification and recycling of water"" during 18-22 February.*

Professional Meetings

Outside Campus
Industry Institute connect

- ***Dr Vishvesh Badheka*** *visited Xylem Water Solutions India Pvt Ltd, Vadodara on 5th Feb 2019 for exploring possibility CP and Joint R & D.*
- ***Dr Vishvesh Badheka*** *visited Bharat Vijay Mills, (Textile Division), Kalol on 9th Feb 2019*
- ***Dr Vishvesh Badheka*** *visited Indian Dairy Machinery Company Ltd, IDMC, Anand on 21st Feb 2019 and interacted with AVP –HR regarding possibility of placement/CP projects*
- ***Dr Vishvesh Badheka*** *visited Pump Tech Industries Pvt Ltd, A'bad regarding ongoing collaborative work on 22nd Feb 2019*
- ***Dr Vishvesh Badheka*** *visited CEAT, Halol and interacted with CEAT mentors and Mr Juban Thomas,VP (R &D) regarding ongoing CP projects (six) on 28th Feb 2019*
- ***Dr Vishvesh Badheka*** *visited INOXCVA, Halol regarding ongoing CP project (three) interacted with Inox mentors on 28th Feb 2019*

Visit to CEAT	Visit to INOXCVA
	

Professional Meetings

Within Campus
Industry Institute connect

- **Dr *Vishvesh* Badheka** organised joint meeting between IIW official, IACE & Mechanical Engineering dept for exploring possibility of collaborative research. Meeting was also followed by visit to IACE site. Mr D V Acharya, COO, INOXCVA invited ME faculties to visit INOXCVA for joint M.Tech dissertation in the area of thermal/design engineering.

- **Dr *Vishvesh* Badheka** arranged Distinguished Professors Welding Research Lab visit : Prof Sajeev Chandra, Prof Mohammed and Prof Rachid Bennancer & Prof Yanovskiy (During ICTEA)

- Mr D G Sharma from GEC Gandhinagar and Dr Gautam Upadhyay, Principal, D.A. Degree Engineering & Technology and Dr Vivek Patel visited PDPU in connection with ongoing collaborative Research on 16th Feb 2019.

- Mr Vishal Harsoda (14BME135D) completed six month collaborative research project on High Wear Resistance Alumina Ceramic at Central Ceramic & Glass Research Institute (CGCRI), Naroda, A'bad. (14th Sept 2018 to 15th Feb 2019)

IIW official, IACE members & Mechanical Engineering Dept. Meeting

Distinguished Professors visit at Welding Research Lab

Visit to PDPU for Ongoing Collaborative Research

Completion of Six Month Collaborative Research Project at Central Ceramic & Glass Research Institute (CGCRI) by Mr Vishal Harsoda

STUDENT ZONE

Publications

Conferences

Ujjawal Jha and M. V. Malladi *presented the following conference paper:*

- ***Ujjawal Jha,*** *Hardik Kagdada, Satyam Shinde, Prafulla kumar Jha, ""Specific heat capacity and lattice thermal conductivity of Aluminum based phase change materials AlSi and AlGe: A Quantum Mechanical Calculation"", ICTEA-2019,23-26 February, PDPU"*
- *"Ramakrishna **M. V. Malladi**, Pranav Nath, Deepak Kumar Agarwal, and S. Sunil Kumar. ""Analytical simulation of helicon discharge for RF power driven plasma engine."" Presented at the 12th International Conference on Thermal Engineering: Theory and Application, 25th February 2019.*
- *Naitik Ghutla, Ramakrishna **M. V. Malladi**, Surendra S. Kachwaha, Garlapati Nagababu, and Amit Sant. ""Numerical study on performance improvements of small scale wind turbine."" Presented at the 12th International Conference on Thermal Engineering: Theory and Application, 24th February 2019."*

Conferences/Workshops Attended

- ***Pratyush Srivastava and Swati Srivastava*** *attended the 'Recent Advances in Modern Manufacturing Processes' National Seminar at PDPU.*
- ***Pratyush Srivastava*** *attended Topical School and Networking Session on Energy and Materials at IIT Gandhinagar.*
- *A team of 6 students (**Rohit Iyer, Nikhil Paravila, Sandeep Yadav, Kirtesh Patel, Ujjawal Jha, Harsh Verma**) from mechanical engineering participated in Gujarat Industrial Hackathon organized by government of Gujarat under the guidance of Dr Rajesh Patel held at BVM college Anand on 21-22 February 2019.The regional level saw 133 teams participation from all over Gujarat with the objective of the competition to solve a problem statement given by the industry under 36 hours.*

Achievements

Palak Patel *15BME087got 1st place in football girls - Justice league GNLU and 1st place football girls- Petrocup and was the captain in both competitions.*

Gujarat Industrial Hackathon

PETROCUP

Reports

Report 1:

ICTEA 2019

12th International Conference on Thermal Engineering: Theory & Applications

Program Report

February 23-26, 2019

School of Technology,

Pandit Deendayal Petroleum University,

Gandhinagar, Gujarat, India

Table of Contents

Day 1: 23rd February 2019

Summary of Inauguration

The 12th edition of International Conference on Thermal Engineering: Theory and Application was held at Pandit Deendayal Petroleum University. The inauguration for the Conference was held on April 23, 2019 at PDPU Auditorium. Many eminent personalities were a part of the inauguration ceremony along with delegates from various parts of India and the world. The Guests for the event were as follows:

1. **Mr. Santosh Joshi**, CEO, GSPC Pipavav Power Company Ltd., Gandhinagar.
2. **Mr. Bose Babu,** Executive Director (Technical Services and Projects), Gujarat State Petronet Ltd.
3. **Mr. Alok Das**, Head, Business Development (Gujarat), Suzlon Energy Ltd.
4. **Prof. Yogesh Jaluria**, Professor at Mechanical Engineering Department at Rutgers University, USA. He is also a Member of Board of Governors at Rutgers University.
5. **Prof. M. Ziad Saghir**, Professor at Mechanical and Industrial Engineering Department, Ryerson University, Canada.
6. **Dr. Palak Sheth**, Director, Planning and Development, PDPU.
7. **Prof. T. P. Singh**, Director, School of Technology, PDPU.
8. **Prof. S. S. Kachhwaha**, Professor, Department of Mechanical Engineering, School of Technology, PDPU.

The Photo summary of the occasion is as follows:

Photo 1.1 Dignitaries on dais during inaugural function of ICTEA 2019

Photo 1.2 Group photo of Dignitaries on dais

Photo 1.3 Presentation of ethnic song by PDPU students during cultural program

Day 2: 24th February 2019

The day of the presentation started with the registration of the present participants during 8-9 AM. It was followed by the important speech and presentation of the Invited speakers as shown below.

- **Prof S. Bandyopadhyay:** He explained about pinch analysis, processes integration Process Integration which are the crucial area for the analysis in recent time for the researcher.
- **Prof S. Chandra:** He has the mastery in the area of heat transfer and fluid mechanics and delivered the lecture in the same topic in such a way that all the research scholars and students of every branch can understand the application easily.
- **Prof Y. Jaluria** delivered a lecture on the optimization of thermal system. He also explained the applicability of thermal system in day to day life. He also explained the importance of computational techniques in the thermal system analysis.
- **Prof S. Jain**

Photo 1.4 Delegates and Faculty interaction during registration

After a half hour coffee break, four parallel paper presentations were started. Each parallel presentation venue comprised of three sessions and each session was dedicated to a specific theme. The participants were given total time of 15 minutes: 10 minutes for the presentation and 5 minutes for the question-answers.

SUNDAY 1.1 | Session: Renewable Energy I

Session chair: Dr. Seshasai Srinivasan

Session Co-chair: Dr. Anurag Mudgal

Presented Paper IDs: 12, 177, 24, 173, 33, 34

SUNDAY 1.1 | Session: Renewable Energy II

Session chair: Dr. Fei Duan

Session Co-chair: Dr. Jaydeep Patel

Presented Paper IDs: 36, 46, 46, 70, 57

SUNDAY 1.1 | Session: Renewable Energy III

Session chair: Dr. Vikas Lakhera

Session Co-chair: Dr. Kush Mehta

Presented Paper IDs: 94, 97, 100, 102, 118, 116

Photo 1.5 Participant presenting research work

SUNDAY 1.2 | Session: Internal Flow and Heat Transfer I

Session chair: Dr. Sonawane Chandrakant
Session Co-chair: Dr. Vivek Patel
Presented Paper IDs: 3, 41, 54, 55, 58, 63

SUNDAY 1.2 | Session: Air Conditioning and Refrigeration I

Session chair: Dr. Sanjeev Jain
Session Co-chair: Dr. Vivek Patel
Presented Paper IDs: 216, 30, 7, 66, 233, 84

SUNDAY 1.2 | Session: Biofuels and Internal Combustion Engines I

Session chair: Dr. Pradeep Kumar
Session Co-chair: Dr. Vinay Vakharia
Presented Paper IDs: 49, 50, 71, 72, 124, 160, 246, 200, 248

SUNDAY 1.3 | Session: Biofuels and Internal Combustion Engines II

Session chair: Dr. Yanovskiy Leonid
Session Co-chair: Dr. Pravin Kodgire
Presented Paper IDs: 218, 145

SUNDAY 1.3 | Session: Renewable Energy IV

Session chair: Dr. Rachid Bennacer
Presented Paper IDs: 134, 224, 198

SUNDAY 1.3 | Session: Melting and Solidification

Session chair: Dr. Seshasai Srinivasan
Session Co-chair: Dr. Vishvesh J. Badheka
Presented Paper IDs: 79, 101, 190, 211, 223

SUNDAY 1.4 | Session: Nano/Micro Heat Transfer I

Session chair: Dr. Yogesh Jaluria
Session Co-chair: Dr. Garlapti Nagababu
Presented Paper IDs: 224, 73, 241, 239

SUNDAY 1.4 | Session: Nano/Micro Heat Transfer II

Session chair: Dr. Sujoy Kumar Saha
Session Co-chair: Dr. Pankaj Sahlot
Presented Paper IDs: 152, 103, 236, 31

SUNDAY 1.4 | Session: Nano/Micro Heat Transfer III

Session chair: Dr. Gulenay Kilic
Session Co-chair: Dr. Anurag Mudgal
Presented Paper IDs: 149, 29, 193

Day 3: 25th February 2019

The day of the presentation started with the registration of the present participants during 8-9 AM. It was followed by the important speech and presentation of the Invited speakers as shown below.

- **Prof M. Lappa :** He has the expertise in the field of multi phase flow and particle dynamics, he delivered the lecture on the area of fluid motion and stability behavior on multi phase flow
- **Prof R. Bennacer:** He has the expertise in the field of transport phenomena in heterogeneous material. He discussed about thermo convective instabilities
- **Prof S. Kumar Saha: He** explained about different techniques for heat transfer enhancement
- **Prof H. Jouhara: elaborated heat energy storage techniques and recent trends in the same.**

Photo 1.6 Prof. Ziad Saghir and Prof. Kachhwaha welcomed all the invited speakers

After a half hour coffee break, four parallel paper presentations were started. Each parallel presentation venue comprised of three sessions and each session was dedicated to a specific theme. The participants were given total time of 15 minutes: 10 minutes for the presentation and 5 minutes for the question-answers.

MONDAY 2.1 | Session: Multi-Phase Flow and Heat Transfer I

Session chair: Dr. P. Muthukumar
Session Co-chair: Dr. Anurag Mudgal
Presented Paper IDs: 214, 43, 95, 115, 117

MONDAY 2.1 | Session: Multi-Phase Flow and Heat Transfer II

Session chair: Dr. Chanitanyamoy Ganguly
Session Co-chair: Dr. Pravin Kodgire
Presented Paper IDs: 128, 139, 136, 137, 142, 39

MONDAY 2.1 | Session: Multi-Phase Flow and Heat Transfer III

Session chair: Dr. Marcelo Lappa
Session Co-chair: Dr. Swapnil Dharaskar
Presented Paper IDs: 147, 166, 228, 175, 138

MONDAY 2.2 | Session: Numerical Method in Fluid Flow and Heat Transfer I

Session chair: Dr. Dibakar Rakshit
Session Co-chair: Dr. Vivek Patel
Presented Paper IDs: 191, 11, 42, 44, 461

MONDAY 2.2 | Session: Numerical Method in Fluid Flow and Heat Transfer II

Session chair: Dr. Mohammed EL GANAOUI
Session Co-chair: Dr. Nirav Patel
Presented Paper IDs: 89, 90, 86, 88

MONDAY 2.2 | Session: Numerical Method in Fluid Flow and Heat Transfer III

Session chair: Dr. Sukanta Kumar Dash
Session Co-chair: Dr. Jatin Patel
Presented Paper IDs: 93, 99, 106, 113, 155, 161

MONDAY 2.3 | Session: Transport Phenomena/Enhanced Oil Recover

Session chair: Dr. Seshasai Srinivasn
Session Co-chair: Dr. Jatin Patel
Presented Paper IDs: 151, 227

MONDAY 2.3 | Session: Single Phase Liquid Cooling

Session chair: Dr. Ziad Saghir
Session Co-chair: Dr. Janardan V.
Presented Paper IDs: 45, 247, 126, 75

Photo 1.7 Certificate distribution by the session chair

MONDAY 2.3 | Session: Polymer Science/Non Newtonian Flow

Session chair: Dr. Gulenay Kilic
Session Co-chair: Dr. Manish Kumar
Presented Paper IDs: 232, 120, 213, 229, 56, 188

MONDAY 2.4 | Session: Numerical Method in Fluid Flow and Heat Transfer IV

Presented Paper IDs: 187, 131, 162, 157, 219

MONDAY 2.4 | Session: Novel Phase Change Cooling Techniques

Session chair: Dr. Sujoy Kr. Saha
Session Co-chair: Dr. Ashish Unnarkat
Presented Paper IDs: 104, 165, 168, 80

MONDAY 2.4 | Session: Renewable Energy V

Session chair: Dr. Rajesh Patel
Session Co-chair: Dr. Abhishek Kumar
Presented Paper IDs: 243, 245, 219, 48, 10

Day 4: 26th February 2019

The day of the presentation started with the registration of the present participants during 8-9 AM. It was followed by the important speech and presentation of the Invited speakers as shown below.

- **Prof M. Muthukumar :** He delivered lecture on recent trends in hybrid power station and car fueling station.
- **Prof M. EI Ganaoui :** He explained about heat and mass transfer through modeling and numerical simulation technique.
- **Prof M. V. Rane:** He gave his views on scope for energy conservation and use of renewable energy in HVAC&R.



Photo 1.8 All the invited speakers were welcomed by Dr. Seshasai Srinivasan

Photo 1.9 Question answer session

After a half hour coffee break, four parallel paper presentations were started. Each parallel presentation venue comprised of three sessions and each session was dedicated to a specific theme. The participants were given total time of 15 minutes: 10 minutes for the presentation and 5 minutes for the question-answers.

TUESDAY 3.1 | Session: Energy Management and Energy Systems I

Session chair: Dr. Laurent Royon
Session Co-chair: Dr. Pravin Kodgire
Presented Paper IDs: 05, 83

TUESDAY 3.1 | Session: Energy Management and Energy Systems II

Session chair: Dr. Pradeep Kumar
Presented Paper IDs: 22, 28, 82, 59, 168

TUESDAY 3.1 | Session: Energy Management and Energy Systems III

Session chair: Dr. Nikhil Dev
Presented Paper IDs: 167, 179, 184, 201, 121

TUESDAY 3.1 | Session: Biological/Biomedical Devices

Session chair: Dr. Nikhil Dev
Presented Paper IDs: 121

TUESDAY 3.2 | Session: Air Conditioning and Refrigeration II

Session chair: Dr. P. Muthukumar
Session Co-chair: Dr. Jatin Patel
Presented Paper IDs: 182, 67, 205, 146, 231, 60

TUESDAY 3.2 | Session: Air Conditioning and Refrigeration III

Session chair: Dr. Ronald M. Barron
Session Co-chair: Dr. Jatin Patel
Presented Paper IDs: 92, 98, 150

Photo 1.10 Session chair evaluating presenter

TUESDAY 3.2 | Session: Advance in Computational Characterization

Session chair: Dr. Pavan Kumar G.
Presented Paper IDs: 135, 37, 53, 163, 170, 181

TUESDAY 3.2 | Session: Waste Management and Waste disposal

Session chair: Dr. Pavan Kumar G.
Presented Paper IDs: 13, 170, 181

TUESDAY 3.3 | Session: Numerical Method in Fluid Flow and Heat transfer V

Session chair: Dr. Andre Bontemps
Session Co-chair: Dr. Vivek Patel
Presented Paper IDs: 209, 212, 221, 195, 226, 15

TUESDAY 3.3 | Session: Renewable Energy VI

Session chair: Dr. M. V. Rane
Session Co-chair: Dr. Vivek Patel
Presented Paper IDs: 183, 196, 132, 199, 208, 217

TUESDAY 3.3 | Session: Environmental Engineering

Session chair: Dr. Anantha Singh
Presented Paper IDs: 40, 62, 110, 112, 127, 77, 186, 215

TUESDAY 3.4 | Session: Heat transfer I

Session chair: Dr. M. V. Rane
Session Co-chair: Dr. Rajesh Patel
Presented Paper IDs: 185, 65, 141, 207, 16

TUESDAY 3.4 | Session: Heat transfer II

Session chair: Dr. Ram Balachandar
Session Co-chair: Dr. Surendra Sari Kumar
Presented Paper IDs: 105, 107, 111, 51, 144

TUESDAY 3.4 | Session: Heat transfer III & Compressible/Incompressible Flow

Session chair: Dr. Pravin Kodgire
Session Co-chair: Dr. Jatin Patel
Presented Paper IDs: 234, 130, 222, 26

Summary of technical sessions

- Total number of paper presented : 203
- Total number of national participants : 184
- Total number of international participants : 19
- Countries of international participants : Canada, U.S.A., Great Britain, France, Turkey, USSR, Singapore, Oman

Closing Ceremony

The closing ceremony of ICTEA-2019 was held on April 26, 2019 05:00 pm onwards. Around 203 papers were presented in the conference of which 184 were presented by national authors and 19 were presented by foreign authors. Apart from India, authors from UK, Canada, France, Australia, Iraq, Nigeria, Japan, Tunisia, Russia, Denmark, Ethiopia and Belarus presented their papers. 8 Best Paper awards were given to the authors, the summary of which is as follows:

Sr. No	Author(s)	Paper Title	Category
1	A. Sharma, P. Kodgire and S. S. Kachhwaha	Comparative analysis of mechanical stirring and process intensification techniques for biodiesel production using waste cotton-seed cooking oil	Bio-Fuels and Internal Combustion Engines
2	K. Sravani, K. Prasannavenkatesan, R. Parameshwaran	Preparation and Characterization of Magnetic Nanoparticles-Enhanced Phase Change Material for Thermal Energy Storage	Nano/Micro Heat Transfer
3	G. K. Singh, R. Patel, R. Panchal, H. Nimawat, S. Pradhan and V. L. Tanna	Design of Experimental Setup for Visualization Studies of Two Phase Liquid Nitrogen	Multi-Phase Flow and Heat Transfer
4	Alok Das, Hardik K. Jani, Garlapati Nagababu, Surendra Singh Kachhwaha	Influence of Techno-Economic Factors on the Levelized Cost of Electricity (LCOE) of Wind and Solar Power Projects in India	Renewable Energy
5	L.S. Yanovskiy, A.V. Baikov, M.V. Gordin, V.E. Sorokin, A.A. Molokanov, Zhou Weixing, A.S. Surovezhko and S.I. Martynenko	Simulation of Heat Transfer in Regenerative Cooling System of Combustion Chamber on Hydrocarbon Fuel	Air-Conditioning and Refrigeration
6	S. K. Bhele	Computational Fluid Dynamics Modeling of Combustion Chamber Using Biodiesel	Numerical Method in Fluid Flow and Heat Transfer
7	Gaganpreet Sidhu, Seshasai Srinivasan and Sanjiwan Bhole	Microstructural Analysis of Heat Treated Steels	Fluid Flow and Heat Transfer
8	Nikhil Dev, Sandeep Kumar and Rajesh Attri	Development of maintenance strategy for thermal power plant using graph theoretic approach	Energy Management and Energy Systems

Various participants shared their experiences during the conference. At the end, the ICTEA-2019 Chairs and Director, School of Technology, PDPU presented the concluding remarks for the conference.

The photo summary of the Closing Ceremony is as follows:

Photo 1.11 Prof. T.P. Singh (Director, SOT) delivering speech during closing ceremony

Photo 1.12 Participants, students and faculties during closing ceremony

Photo 1.13 Prof. M.Z. Saghir and Prof. S.S. Kachhwaha during closing ceremony

Photo 1.14 Hardik Jani receiving Best paper award in the category of Renewable Energy

Photo 1.15 Anvita Sharma receiving best paper award in the category of Bio-Fuels and Internal Combustion Engines

Photo 1.16 Dr. Nikhil Dev, YMCA University receiving best paper award in the category of Energy Management and Energy Systems

Photo 1.17 Photograph of Prof. M.Z. Saghir and Prof. T.P. Singh

Photo 1.18 G.K. Singh receiving best paper award in the category of Multi-Phase Flow and Heat Transfer

Photo 1.19 Group photograph of PDPU SOT faculties and staff with Prof. M.Z. Saghir

Details of the Sponsors of the ICTEA 2019 Conference:

Sr. No.	Name	Amount (Rs.)
01	DST, Delhi	2,00,000
02	GUJCOST	1,00,000
03	KP Energy Ltd	1,00,000
04	I.C.E. GATE Institute	50,000
05	Colourtex Industries Ltd.	50,000
06	Citizen Industries	30,000
07	Sim Infosystems Private Limited	20,000

Report 2 :

An Interactive session

International Delegates and 3rd year students.

An Interactive session with International Delegates and 3rd year students of Mechanical Engineering was arranged. Professors gave their insights about higher studies and future prospects of thermal engineering and their importance in mechanical engineering.

Photo 2.1 Interaction with International Delegates

Following professors actively participated in the interaction.
1) Prof. M Ziad, Ryerson University, Canada
2) Prof. Yogesh Jaluria, Rutgers University, USA
3) Prof. Rachid Bennacer, France
4) Prof. Mohammed Al Ghanoui, France
5) Prof. Andre Bontemps, France
6) Prof. Laurent Royon, France
7) Prof. Gulenay Killic, Turkey
8) Prof. Leonid Yanovskiy, Russia

Report 3 :

Interactive discussion

On

Petroleum Conservation Research Association (PCRA)

A brief seminar was delivered by Mr. Chirag Chauhan and other officials of Indian Oil Corporation Limited (IOCL) on importance and need of Energy conservation and also gave some aspect of renewable energy. As we all know, energy demand is increasing day by day, but the availability of resources is depleting. To tackle such severe global issue, he addressed many different solutions. It included energy saving techniques, use of renewable energy resources as well as Nuclear energy and biofuels. Development of Carbon Sink is also important aspect which helps in reducing CO_2 gases. The seminar proceeded with measures taken by government of India to reduce over-dependency of natural resources like Coal and Gas for power generation and shifting towards clean and green power generation methods. According to Paris Agreement in 2016, India aims to increase its power generation via renewable generation methods till 175 MW by 2022. It is proposed that this enormous target will be accomplished by following division – Solar Energy: 100 MW, Wind Energy: 60 MW, Other renewable energy sources – 15MW.

The seminar concluded with an interactive talk with new innovations and techniques which should be used in order to save the energy. Frank Gandhi, Sarthak Lalchandani, Rishabh Agrawal and Krutarth Dave were awarded as – 'Best Speakers' for actively participating, interacting and bringing out fruitful discussion during seminar by Mr. Chirag Chauhan. Lastly, all present delegates and participants took pledge to save the energy and use it as efficiently as possible.

Participants in this Interactive discussion:

1. Sarthak Lalchandani
2. Frank Gandhi
3. Krutarth Dave
4. Rishabh Agrawal
5. Fenil Modi
6. Chirag B. Parmar
7. Sachin Shah
8. Parin Matalia
9. Viraj Tolia
10. Anand J. Patel
11. Kaushal J. Shah

Co-ordinated by: Mr Parth Prajapati & Dr. Vishvesh Badheka

Photo 3.1

Photo 3.2

Photo 3.3

Report 4 :

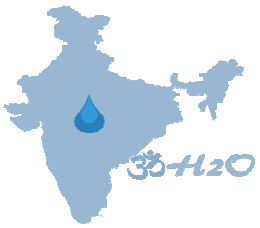
Department of Biotechnology
Ministry of Science & Technology,
Government of India

European Commission

सत्यमेव जयते
Department of Science and Technology
Ministry of Science and Technology
Government of India

bIo-mimetic and phyto-techNologies DesIgned for low-cost purificAtion and recycling of water

INDIA-H_2O



Participant No	Participant organisation name	Country
1 **(EU-CO)**	**UNIVERSITY OF BIRMINGHAM (UOB)**	UK (UNITED KINGDOM)
2 **(IND-CO)**	**PANDIT DEENDAYAL PETROLEUM UNIVERSITY (PDPU)**	IN (INDIA)
3	ASTON UNIVERSITY (AU)	UK (UNITED KINGDOM)
4	PLATAFORMA SOLAR DE ALMERÍA (CIEMAT)	ES (ESPAIN)
5	NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE (NEERI)	IN (INDIA)
6	AQUAPORIN (AQP)	DK (DNMARK)
7	AQUAPORIN ASIA (AQPA)	SG (SINGAPORE)
8	UNESCO-IHE. (IHE)	NL (NETHERLAND)
9	ACONDICIONAMIENTO TARRASENSE ASSOCIACION (LEITAT)	ES (ESPAIN)
10	GB PANT UNIVERSITY OF AGRICULTURAL TECHNOLOGY (GBP)	IN (INDIA)
11	CSIR-CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE (CEERI)	IN (INDIA)
12	ARVIND MILLS (ARV)	IN (INDIA)
13	MODUS RESEARCH AND INNOVATION (MOD)	UK (UNITED KINGDOM)
14	BEN GURION UNIVERSITY (BGU)	IS (ISRAEL)
15	DAVEY (DAV)	IN (INDIA)
16	ACWADAM (ACW)	IN (INDIA)
17	JADAVPUR UNIVERSITY (JU)	IN (INDIA)
18	ENVIROCHEM SERVICES (ECS)	IN (INDIA)
19	GUJARAT CHEMICAL ASSOCIATION (GCCI)	IN (INDIA)
20	MADHUR MILK DAIRY (MMD)	IN (INDIA)
21	FUNDACION CENTRO TECNOLOGICO DE INVESTIGATION MULTISECTORAL (CITEM)	ES (ESPAIN)

The overall aim of INDIA-H_2O is to develop, design and demonstrate high-recovery low-cost water treatment systems for saline groundwater and for domestic and industrial wastewaters. The focus for developments will be in the arid state of Gujarat, where surface water resources are very scarce. Cost-effective technologies and systems are proposed with the aim of lowering energy costs through dramatic improvements in energy efficiency, new bio-based approaches to water recycling, and use of renewable energy. Reject waste streams will be minimised or reduced to zero, thus protecting the environment. The specific objectives are to:

1. **Develop and introduce novel batch-reverse osmosis technology for a 4-fold reduction in specific energy consumption with high, 80%, recovery ratio**
2. **Develop forward osmosis based on revolutionary biomimetic membrane technology, for use in wastewater recovery applications including hybrid arrangements with reverse osmosis for further reduction in energy consumption, resulting in an order of magnitude overall reduction in SEC.**
3. **Pilot small-scale (5–50 m^3/day) rurally-relevant low-cost systems for brackish groundwater treatment to provide safe drinking water at costs below €0.35/m^3 (<30 rupees/m^3).**
4. **Develop phyto-technology solutions for rural domestic wastewater treatment to remove emerging pollutants (e.g. agricultural products), manage rejected brines, and recover energy from the resulting biomass.**
5. **Develop and demonstrate cost-effective high-efficiency FO/BRO systems with complementary hybrid technologies for industrial desalination, wastewater treatment and recycling with minimum liquid discharge (up to 80% water recovery).**
6. **Create a Centre of Excellence in water treatment membrane technologies, design operation, piloting, demonstration, training and dissemination in India.**
7. **Develop and support the evolution of business models to exploit the developed solutions to mutual EU/India economic advantage**
8. **Brief and influence policymakers on economic models and governance arrangements for viable adoption of these technologies in India.**

Focusing initially on the arid regions of North-West India, where water is most scarce due to limited and seasonal rainfall, this project will develop solutions for widespread applications and perform pilot system demonstrations to improve levels of quality water available for re-use and resource recovery - thus addressing the urgent challenge of increasing water-scarcity across India as a whole.

Advanced membrane processes, including biomimetic FO and RO and layer-by-layer assembly of ultra/nano-filtration membranes, will be developed and combined to provide new methods of purifying water from saline groundwater and from municipal and industrial wastewaters, providing water that is safe for drinking or suitable for irrigation. They will be implemented in cost-effective modes in systems incorporating phytoremediation and complementary processes.

Low-cost sensors for real-time monitoring of the key parameters important for efficient operation of membrane processes will be integrated with monitoring and management systems to ease maintenance of performance and ensure sustainability of these systems which

have previously suffered from a lack of robust and reliable operational data, leading to frequent early failure and redundancy. The remote monitoring will also make possible collection of data to enable knowledge to be built up about long term performance, feeding into decision support tools for design and operation.

Systems will be developed and integrated to TRL6 as advanced prototypes that will be integrated with renewable energy sources under real operational conditions in the arid and industrialised state of Gujarat, with prospective applications in many other water-stressed and salinized areas such as Rajasthan, Punjab and Tamil Nadu. The development of business models will maximise the use of indigenous supply chains to reduce costs and ensure sustained implementation of the technologies.

A glimpse of KO meeting during 18-22nd March, 2019 and moments during field visits during the meeting and prior to it on 16-17th March 2019 are attached as Report 4.

Field visit moments of Lodhva village, Distt Somnath, Gujarat- 16th February 2019

Field visit moments of Keshod- Lushada village, Distt Porbander, Gujarat- 17th February 2019

KO meeting and industry/ field visit moments during 18th- 22nd February 2019

Newsletter Coordinators

Faculty Coordinator: Dr Pankaj Sahlot

Staff Coordinator: Mrs Pooja Nimavat