Preface
Advances in Thermal-Fluids Engineering (ATFE 2021)

25-26 March 2021, Gandhinagar, India

About the Conference
A two-day conference was organized by Department of Mechanical Engineering, Pandit Deendayal Petroleum University (PDPU), Gandhinagar with the aim to bring together leading academic scientists, researchers and research scholars across the country to share their experiences and research findings in all aspects of Advances in Thermal-Fluids Engineering. It also provides a premier interdisciplinary platform for researchers, academicians and industry personal to present and discuss the most recent innovations, trends, and challenges encountered and the solutions adopted in the field of Thermal-Fluid Engineering.

Motive:
The main aim of organizing this conference was to introduce the participants to new advancements in the field of thermo-fluid engineering and to provide an interdisciplinary platform to put forward their research explorations and findings during the conference in the field of Thermal-Fluid Engineering.

Conference topics include but not limited to:
- Fuels and Combustion
- Computational Methods in Thermal-fluid Systems
- Energy and Sustainability
- Energy-Water-Food Nexus
- Engineering Equipment and Environmental Systems
- Experimental Methods/Tools and Instrumentation in Fluid Mechanics and Heat/mass Transfer
- Flow Instability
- Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids
- Multiphase Flow and
- Turbulent Flows
- Advanced Energy Systems
- CFD and Numerical Heat/Mass Transfer
- Energy Conservation and Storage Techniques
- Heat/Mass Transfer Enhancement Techniques
- Heat/Mass Transfer In Renewable and Clean Energy Systems
- Heat/Mass Transfer In Pollutant Emission Control Systems
Event Description:

The preparation of the event was started in the month of September 2020 and the event was proposed by Department of Mechanical Engineering, PDPU that was supported by the Management. Gujarat Council on Science and Technology (GUJCOST) also funded the event. The conference was held on 25th – 26th March, 2021. Around 80 papers were received of which 56 were shortlisted for presentation based on the review of experts from industry and academia. These papers were presented under Eight Tracks namely:

1. Experimental and numerical heat transfer
2. Energy and sustainability
3. Fluid flow and CFD
4. Thermal system analysis and optimization
5. IOT and Industry 4.0
6. Fuels and Combustion
7. Heat and fluid flow
8. Water Desalination and Waste Water Treatment

The event started with Saraswati Vandana followed by Welcome address by Conference Convener Dr. Rajesh Patel. This was followed by Speech from Dr. Vishvesh Badheka HoD, Mechanical Engineering Department, PDPU who gave a brief overview of the Department and research activities and facilities. This was followed by Director’s address by Prof. Sunil Khanna and DG’s Address by Prof. S.S. Manoharan, honorable Director General, PDPU. Message from Guest of Honour Dr. Narottam Sahoo, Advisor & Member Secretary, Gujarat Council on Science and Technology, Govt. of Gujarat was delivered. This was followed by the address of the Chief Guest Mr. Prashant Pathak, President: ISHRAE, Ahmedabad. The inauguration ceremony was concluded with Vote of thanks from the conference Co-convener Dr. Vivek Patel.

There were four Keynote Speeches. The first keynote speech was delivered by Prof. PMV Subbarao, Professor, Mechanical Engineering Department, IIT Delhi on topic- “Analysis of Fluid Flow in Micro-scale Channels”. This was followed by two parallel sessions on Track 1 and Track 2. The second half on Day 1 started with Keynote Speech by Prof. MV Rane Professor, Mechanical Engineering Department, IIT Bombay. His topic was “Rotating Contacting Disks Enabling Efficiency Improvements: In Cooling Towers, Evaporative Coolers
& Condensers, Waste Water Vaporizers, Biogas Scrubbers, etc.” This was followed by two parallel sessions on Track 3 and Track 4.

Day 2 began with the Keynote address by Prof. Santanu Bandyopadhya, Professor, Department of Energy Science and Engineering, IIT Bombay, on topic “Pinch Analysis for Heat Integrated Water Allocation Networks.” This was followed by two parallel sessions on Track 5 and Track 6. The second half on Day 2 started with Keynote address by Prof. Philip Davis, Professor, University of Birmingham, Edgbaston, Birmingham, UK on “Batch Reverse Osmosis for Energy Efficiency in High Recovery Desalination.”

Event Overview:
This two-day conference was a big success with lot of information shared through this platform. The participants thanked the organizers for knowledge transfer that took place during the two days of the event. The event finally concluded by Vote of Thanks by Conference Convener, Dr. Rajesh Patel.

- Reasons why the meeting was changed to a virtual format:
The conference Advances in Thermal-Fluids Engineering (ATFE 2021) was announced in the month of September 2020. In the beginning it was very difficult for anyone to predict the severity of Covid-19 Corona virus infection and from the day one we were open for all the possible format for organizing ATFE 2021 i.e. offline, hybrid (online and offline) and online. However, In January 2021, the Covid-19 pandemic situation was not favourable to conduct ATFE 2021 meeting offline as spreading of corona virus was very fast and number of active cases in India was around half million. Looking at the response to the ATFE 2021 in terms of submission of research articles and request of all the participant, we have decided to conduct the ATFE 2021 through virtual format.

- Why the meeting was virtual instead of being postponed:
Since, announcement of conference was take place in September 2020. Postponed of the conference demoralised the researchers as they already submit their work to the conference. Further, the postponed of the conference adversely affect the research community as the research work reach to them with delay. Such delay also affects the on-going work of research community. Considering these aspects, the conference was conducted as per schedule through virtual mode instead of being postponed.

- Virtual Conference Dates:
25th – 26th March, 2021

- Location of organisers:
Pandit Deendayal Petroleum University, Gandhinagar, Gujarat, India
• **Conference model: Information on plenary sessions. Amount of time that authors/presenters were given to talk:**
  Eight sessions/track were arranged during two days (Please see the ATFE-2021 Schedule document and also available at [http://sot.pdpu.ac.in/atfe.html](http://sot.pdpu.ac.in/atfe.html)). Each session/track focused on the particular theme. Authors are given to 10 minutes time for presentation followed by 5 minutes Q and A. A session chair and co-chair along with moderator manage the Q and A session. The best paper of each session was also declared.

• **Information on discussions and Q&A sessions:**
  Authors are given to 10 minutes time for presentation followed by 5 minutes Q and A. A session chair and co-chair along with moderator manage the Q and A session. The best paper of each session was also declared.

• **Location of participants and overall participant numbers:**
  Prominent institutes like IITs, NITs, and other state and deemed universities across the India. More than 150 Participant attend the conference.

• **Technology that was used to deliver the conference:**
  Microsoft-Team (MS-Team)

• **Any reports on overall technical quality and success of delivery of the conference.**
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Prof. M.V. Rane
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