Report STC/FDP on "Design and Optimization of Thermal Systems: An Experimental and Computational Approach" (16-20th June 2025)

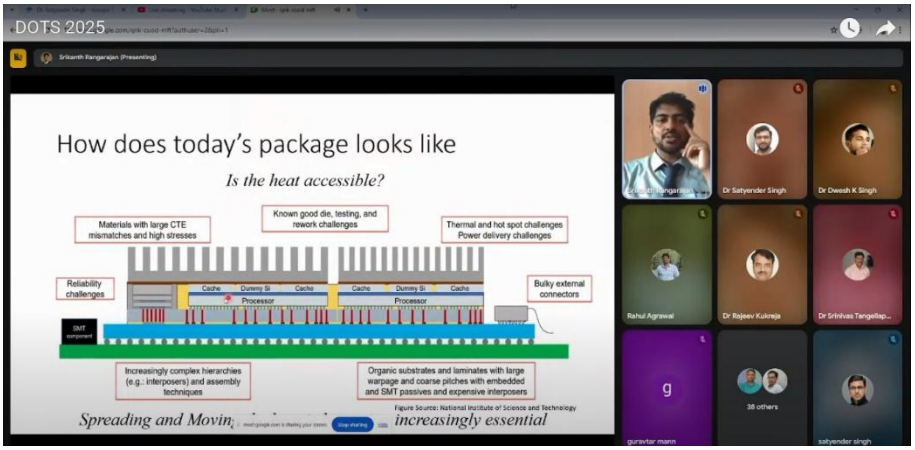
Five days Online Short Term Course on "Design and Optimization of Thermal Systems: An Experimental and Computational Approach" was organized by Department of Mechanical Engineering, Dr. B. R. Ambedkar National Institute of Technology Jalandhar, Punjab from 16-20th June 2025. The theme of the STC offered broad converge to the topics on the "Design and Optimization of Thermal Systems" related to: Fluid dynamics, heat transfer, turbomachinery, wind engineering, hydrodynamic/aerodynamic bodies, engines, refrigeration, combustion, solar engineering, battery management, AI/ML applications in thermal engineering, etc. and also covered extensively the following topics:

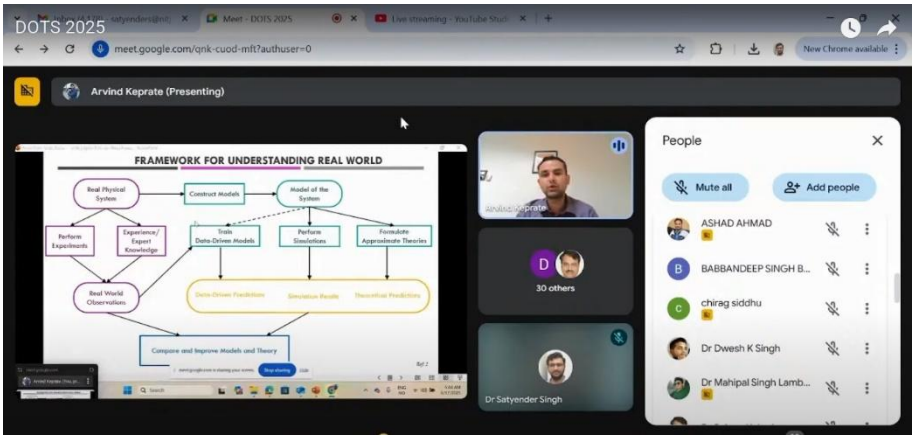
- **Design and Optimization of Electronic Cooling Systems**
- **AI/ML of Integrated Thermal Technologies**
- **Bond Graph-based Modelling and Diagnosis of Complex Multiphysics Systems**
- **Solar Thermal Systems**
- **Thermal Management of Battery Energy Storage Systems (BESS*)***

The main objective of this program was to introduce participants the most important aspect as per the present industrial and academic requirements, i.e., "How to design and optimize thermal systems through experimental and computational approaches". In the event around 70 participants from India as well as abroad registered and successfully completed the course. In this short term course, invited speakers were from the recognized Indian and foreign institutes and industries such as **Binghamton University (USA), University of Oslo (Norway), University of Lille (France), Godrej Appliances (India), Alfanar Electric (Saudi Arabia).**

Some glimpse of the STC:


guravtar mann
ASHISH KUMAR
Dr Dwesh K Singh
satyender singh
2:47 PM | qnk-cuod-mft


DOTS 2025
Srikanth Rangarajan (Presenting)
How does today's package looks like
Is the heat accessible?
Materials with large CTE mismatches and high stresses
Known good die, testing, and rework challenges
Thermal and hot spot challenges Power delivery challenges
Reliability challenges
Bulky external connectors
Cache
Dummy Si
Processor
SMT component
Increasingly complex hierarchies (e.g.: Interposers) and assembly techniques
Organic substrates and laminates with large warpage and coarse pitches with embedded and SMT passives and expensive interposers
Figure Source: National Institute of Science and Technology
Spreading and Movin
increasingly essential
Dr Satyender Singh
Dr Dwesh K Singh
Rahul Agrawal
Dr Rajeev Kukreja
Dr Srinivas Tangellap...
38 others
guravtar mann
satyender singh


DOTS 2025
Meet - DOTS 2025
meet.google.com/qnk-cuod-mft?authuser=0
New Chrome available
Arvind Keprate (Presenting)
FRAMEWORK FOR UNDERSTANDING REAL WORLD
Real Physical System
Construct Models
Model of the System
Perform Experiments
Experience/ Expert Knowledge
Train Data-Driven Models
Perform Simulations
Formulate Approximate Theories
Real World Observations
Compare and Improve Models and Theory
30 others
Dr Satyender Singh
People
Mute all
Add people
ASHAD AHMAD
BABBANDEEP SINGH B...
chirag siddhu
Dr Dwesh K Singh
Dr Mahipal Singh Lamb...