ASME 2012 Gas Turbine India Conference
presented by the ASME International Gas Turbine Institute

December 1, 2012 | Mumbai, Maharashtra, India
Schedule at a Glance

Registration: 7:00 a.m. – 5:00 p.m.
Presenter Coffee: 7:30 a.m. – 8:00 a.m.
Morning Sessions: 8:00 a.m. – 10:00 a.m.
Exhibit Open: 9:30 a.m. – 6:00 p.m.
Inaugural Address: 10:00 a.m. – 10:50 a.m.
Forenoon Sessions: 11:00 a.m. – 12:20 p.m.
Lunch: 12:20 p.m. – 1:30 p.m.
IGTI India Chapter Meeting: 1:00 p.m. – 1:20 p.m.
Afternoon Sessions: 1:30 p.m. – 3:30 p.m.
Coffee Break: 3:30 p.m. – 3:50 p.m.
Afternoon Sessions: 3:50 p.m. – 5:30 p.m.

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On behalf of the IGTI Board of Directors, our chairman Prof. Thomas Sattelmayer, and the IGTI staff, I would like to welcome you to the first ASME Gas Turbine India Conference 2012. The primary focus of this conference is to bring together those from across India who are working in industry, academia, and government to hear the latest developments in gas turbine technology. Our endeavor has been to provide the platform to share great ideas from within India and Asia at large. We chose the business Capital of India, Mumbai to host the first ASME GT conference because it is a city with a rich history of small initiatives having a great impact for India and a city that celebrates diversity.

This year’s keynote theme is “Development of Gas Turbine Technology in India.” Those working the in the gas turbine field in India are aware that there is a great opportunity for technological development in the area of gas turbines in this country. Dr. Vijay Kumar Saraswat, Chief Scientific Advisor to Defense Minister, being one of the most knowledgeable gas turbine experts in India, will address the opportunities and challenges in India. He will also provide the Indian perspective on how to fuel growth through research and development to meet the future requirements for aero engines and power systems.

An estimated 300 conference participants will have the opportunity to attend 20 technical sessions in 4 major technical categories, including Aerodynamics, Thermal, Structures and GT Operability. There will be 90 final technical papers presented by leading experts. As this is our first conference in India our efforts have been focused on providing and maintaining the highest possible technical standards for the papers. We also hope to provide the best networking opportunities between industry, academia & governmental organizations.

Finally, on behalf of IGTI, we graciously thank all those companies who have supported GT India conference 2012 through sponsorship. This event would not be possible without the hundreds of hours spent by the volunteers who served as authors, reviewers, session organizers, and vanguard chairs. Given the overwhelming response of 250 abstracts in the first year, a big round of applause needs to be given to Prof. Bhamidi VSS Prasad, Review Chair, and Prof. Amboor Madathil Pradeep, Technical Program Chair for all their dedicated work in handling the technical papers. Our sincere thanks to Prof. Seung Jin Song, Conference Chair, (IGTI) and Prof Howard Hodson, Review Chair, (IGTI) for their support and guidance. Finally, much appreciation goes to the IGTI staff that pulled everything together in a seamless way. We trust your time here will be both enjoyable and professionally rewarding. Thank you for attending.
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Inaugural Address...

Development of Gas Turbine Technology in India

Saturday, December 1, 2012 • 10:00 a.m. | Champagne II

Born in 1949, Dr. Saraswat completed his Bachelors in Engineering from Madhav Institute of Technology & Science, Gwalior, MTech from Indian Institute of Science (IISc) Bangalore, and obtained a Doctorate in Propulsion Engineering from Osmania University.

Dr. Saraswat, a Ph.D. in Combustion Engineering, started his career in DRDO in 1972 at the Defence Research and Development Laboratory (DRDL), Hyderabad and was responsible for the development of country’s first Liquid Propulsion Engine, DEVIL. As Project Director of Prithvi, he steered the design, development, production and induction of the first indigenous Surface-to-Surface missile system into the armed forces. The successful testing of Dhanush missile on board a moving ship with high terminal accuracy brought a new dimension to the national defence capability. As Program Director AD (Air Defence), Dr. Saraswat pioneered the concept of theatre defence system and integration of national Air Defence elements. He was Director, Research Centre Imarat (RCI) before taking over as CCR&D (MSS) in November 2005. He established facilities for design, production and testing of engines and the RCS technologies for the missile applications. Under the able leadership of Dr. Saraswat, India has embarked on a challenging, futuristic Air Defence Programme encompassing development of complex anti-ballistic missile systems, radars, C41 systems and integration of battle management resources into a national authority. As Programme Director, he has spearheaded the concept of theatre defence systems and integration of national Air Defence elements. As Director, Research Centre Imarat, Hyderabad, he conceptualised and established facilities for development of Micro and Nano Sensors for future avionics.

Dr. Saraswat is the recipient of DRDO Scientist of the Year Award - 1987, National Aeronautical Prize - 1993, DRDO Technology Transfer Award - 1996 and Performance Excellence Award - 1999. For his outstanding contributions to the Nation, he has been conferred with Padma Shri in 1998.

Vijay Kumar Saraswat presently serves as the Director General of the Defence Research and Development Organisation, Secretary of Defence Research and development and the Chief Scientific Advisor to the Minister of Defence.
# Session Schedule

<table>
<thead>
<tr>
<th>ROOM</th>
<th>08:00 - 10:00</th>
<th>11:00 - 12:20</th>
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<tbody>
<tr>
<td>Bordeaux</td>
<td>AERODYNAMICS Axial Compressors I</td>
<td>AERODYNAMICS Wind Turbines &amp; Propellers I</td>
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<td>GAS TURBINE SYSTEM OPERABILITY &amp; PERFORMANCE Performance I</td>
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<td>STRUCTURES &amp; DYNAMICS General Topics and Vibration</td>
<td>STRUCTURES &amp; DYNAMICS Fatigue and Fracture II</td>
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ASME Gas Turbine India 2012
Leadership Team

**Conference Chair**
Joseph Machnaim
GE Aviation
Bangalore, India

**Conference Chair, IGTI**
Prof. Seung Jin Song
Seoul National University
Seoul, Korea

**Technical Program Chair**
Prof. Amboor Madathil Pradeep
Indian Institute of Technology Bombay
Mumbai, India

**Review Chair**
Prof. Bhamidi VSS Prasad
Indian Institute of Technology Madras
Chennai, India

**Review Chair, IGTI**
Dr. Howard Hodson
University of Cambridge
Whittle Laboratory
Cambridge, UK
NUMECA International is a leading software developer and solution provider for fluid dynamics simulations. Our solutions allow engineers and designers to predict physical behavior of complex systems where fluids (liquid or gas) play a significant role.

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- Highly accurate simulations for better product and systems development;
- Multiphysics collaborative framework;
- New generation of pre- and post-processing systems;
- Integrated CAD design and optimization systems;

and much more ...
Session Details

SATURDAY, DECEMBER 1, 2012 | 08:00 to 10:00

**TRACK: AERODYNAMICS**

**1-1 Axial Compressors I**

*Session Chair: Joseph Mathew, Indian Institute of Science*
*Session Co-Chair: Trilok Vashist, Infotech Enterprises Limited*

Chetan Kumar Mistry, Indian Institute of Technology Bombay; Pradeep A, Indian Institute of Technology Bombay

**GTIndia2012-9571 – CFD Code Validation and Qualitative Study of Effects of Tip Clearances on Performance of Transonic Axial Compressor Rotor**

**GTIndia2012-9639 – The Effect of Reynolds Number on Transonic Compressor Blade Rotor Section**
Alireza Shahrabi Farahani, Amir Kabir University; Ali Madadi, Amir Kabir University of Technology; Hossein Beheshti Amiri, Amir Kabir University (Tehran Polytechnic); Alireza Fathi, K. N. Toosi University of Technology; Habib Khazaei, Amir Kabir University of Technology

**1-3 Centrifugal Compressors I**

*Session Chair: Dr Jagadish Kshirsagar, Kirloskar Brothers Limited*
*Session Co-Chair: Christian Aalborg*

**GTIndia2012-9525 – Effect of Impeller Blade Trimming on the Performance of a 5.5:1 Pressure Ratio Centrifugal Compressor**
Daniel Swain, Michigan State University; Abraham Engeda, Michigan State University

**GTIndia2012-9529 – Effects of Inlet Pressure Distortion on the Performance and Flow Field of a Centrifugal Compressor at Off-Design Conditions**
Sitaram N, IIT Madras; K. V. Murali, CEMILAC; Govardhan M, Indian Inst of Technology Madras

**1-5 Axial Turbines I**

*Session Chair: Ravikanth Avancha, GE Aviation*
*Session Co-Chair: Hiteshkumar Mistry, GE Global Research*

**GTIndia2012-9537 – Aerodynamic Measurements on the Interaction of Secondary Jets and Separation Bubble**
Subrata Sarkar, Indian Inst of Tech Kanpur; Samson A Ratna Kumar, IIT Kanpur

Room Name: Bordeaux

Room Name: Olio

Room Name: Champagne II
Session Details

**TRACK: THERMAL**

2-3 Combustion, Fuels and Emissions

Session Chair: Achintya Mukhopadhyay, Jadavpur University  
Session Co-Chair: Vasudevan Raghavan, Indian Institute of Technology Madras

GTIndia2012-9543 – Multi Eulerian PDF Transport Modelling of Turbulent Swirling Flame  
Abhinav Kapoor, Indian Institute of Technology Kanpur; Ashoke De, Indian Institute of Technology Kanpur; Rakesh Yadav, ANSYS Fluent India Pvt. Ltd.

GTIndia2012-9719 – Numerical Investigation of Combustion Characteristics in a Liquid Fuelled Can Combustor  
Vivek Pandey, Indian Institute of Technology Kanpur; Ashoke De, Indian Institute of Technology Kanpur; Abhijit Kushari, Indian Institute of Technology Kanpur

GTIndia2012-9585 – Detection Of Precusor At Blowout in Non/Partially Premixed Gas Turbine Type Combustor At Atmospheric Pressure  
Kurpet P Aditya, Indian Institute of Technology Madras; Thiruchengode M Muruganandam, Indian Institute of Technology Madras

GTIndia2012-9613 – Evaluating Fuel Flexibility in an IGCC Combustor Using CFD  
Abinash Barua, GE India; Hasan Karim, GE; Azardokht Hajiloo, GE

GTIndia2012-9620 – Thermal Analysis of Gas Turbine Bearing Compartment During Normal Operation  
Nagaraju Kanike, Infotech Enterprises Ltd; Dateswara Taluru, Infotech Enterprises Ltd; Krishna Nelanti, Infotech Enterprises Limited; Kamlesh Gujar, Infotech Enterprises Limited

GTIndia2012-9728 – Laminar Burning Velocity of LPG-Air Mixture at Elevated Temperatures  
Mohammad Akram, Indian Institute of Technology Bombay; Sudarshan Kumar, IIT Bombay; Priyank Saxena, Solar Turbine Inc.
Session Details

**TRACK: STRUCTURES & DYNAMICS**

**3-5 General Topics and Vibration**

Session Chair: Ashish Darpe, IIT Delhi  
Session Co-Chair: Jagdish Thammanna, UTC Aerospace Systems

- **GTIndia2012-9527** – Multistage Coupling of Eight Mistuned Bladed Disk on a Solid Shaft, Forced Vibration Analysis  
  Romuald Rzadkowski, Institute of Fluid-Flow Machinery; Artur Maurin, Institute of Fluid-Flow Machinery, Polish Academy of Sciences

- **GTIndia2012-9586** – Health Monitoring of Gear Elements Based on Vibrations by Support Vector Machine Algorithms  
  Rajiv Tiwari, IIT Guwahati; Dhruba Jyoti Bordoloi, Indian Institute of Technology Guwahati

- **GTIndia2012-9542** – Identification of Multiple Faults with Incomplete Response Measurements in Rotor-Bearing-Coupling Systems  
  Rajiv Tiwari, IIT Guwahati; Mohit Lal, Indian Institute of Technology Guwahati

- **GTIndia2012-9521** – Comparison of Fluid-Structure Coupling Methods for Blade Forced Response Prediction  
  Florent Payer, Snecma; Pascal Ferrand, Laboratoire de Mécanique des Fluides et d’Acoustique; Alain Dugeai, Onera; Fabrice Thouverez, Laboratoire de Tribologie et Dynamique des Structures

- **GTIndia2012-9551** – The Fluid-Thermal-Structure Coupled Analysis and Optimization of Turbine Mortise/ Disc  
  Xiuli Shen, BeiHang University; Xiaodong Qi, BeiHang University; Shaoying Dong, BeiHang University

- **GTIndia2012-9593** – Voxel-based Approach for Computation and Optimization of Unoccupied Space in CAD Assemblies  
  Rahul Rajadhyaksha, Geometric Limited; C Saikrishna Swamy, Geometric Limited; Nabarun Paul, Geometric Limited

**SUNDAY, DECEMBER 2, 2012 | 11:00 to 12:20**

**TRACK: AERODYNAMICS**

**1-9 Wind Turbines & Propellers I**

Session Chair: L Venkatakrishnan, National Aerospace Laboratories  
Session Co-Chair: Vidyadhar Mudkavi

- **GTIndia2012-9617** – Effect of Some Design Parameters on Performance of a Shutter Type Vertical Axis Wind Turbine  
  Sandeep Wangikar, SVERI’s College of Engineering; Nitin Misal, SVERI’s College of Engineering

- **GTIndia2012-9623** – An Effect of Spacing and Surface Finish on the Performance of Bladeless Turbines  
  Hanumant Borate, VPCOE, Baramati; Nitin Misal, SVERI’s College of Engineering

- **GTIndia2012-9655** – A Numerical Investigation to Study Effects of a Savonius Rotors Plate Shape on its Optimum Overlap Ratio  
  Morteza Abbaszadeh, Urmia University; Fariba Bagherzadeh, Sharif University of Technology; Mina Iravani, Sharif University of Technology

- **GTIndia2012-9656** – A Numerical Investigation on Effects of Gap Between Plates of Savonius Vertical Axis Wind Turbines with Different Shapes on Their Performance  
  Morteza Abbaszadeh, Urmia University; Fatemeh Doroodian, Sharif University of Technology

Room Name: Burgundy

Room Name: Bordeaux
Session Details

**TRACK: THERMAL**

### 2-2 Film Cooling II

**Session Chair: Subrata Sarkar, Indian Inst of Tech Kanpur**

**GTIndia2012-9558 – Experimental Evaluation of Cooling Effectiveness of High Pressure Turbine Nozzle Guide Vane**
Venkata Subramanya, Gas Turbine Research Establishment; Vasudev S A, Gas Turbine Research Establishment; Sunil Chandel, DIAT (DU)

**GTIndia2012-9560 – TLC Measurements of Heat Transfer Under Rotating Conditions at High Reynolds Number in an Inovitative Trailing Edge Cooling System**
Beniaiche Ahmed, Ecole Doctorale d’Energetique et Developpement Durable (EDEDD) Université M’hamed Bougara; Carcasci Carlo, Sergio Stecco Department, University of Florence; Bonanni Leonardo, Sergio Stecco Department, University of Florence

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### 2-4 Combustion

**Session Chair: Sudarshan Kumar, IIT Bombay**

**GTIndia2012-9602 – Numerical Simulation to Characterize Homogeneity of Air-Fuel Mixture for Premixed Combustion in Gas Turbine Combustor**
Kamalika Chatterjee, Jadavpur University; Arkdeep Kumar, Jadavpur University; Swarrender Sen, Jadavpur University; Souvick Chatterjee, Jadavpur University; Achintya Mukhopadhyay, Jadavpur University

**GTIndia2012-9640 – A Detailed Validation Study of Multi Environment Eulerian PDF Transport Method for Modelling Turbulent Non Premixed Combustion**
Rakesh Yadav, ANSYS Fluent India Pvt. Ltd.; Abhijit Kushari, Indian Institute of Technology Kanpur; Vinayak Esvaran, I.I.T Hyderabad; Atul Verma, Ansys Fluent India Pvt. Ltd.

**GTIndia2012-9671 – Thermodynamic Analysis of Evaporation Characteristics of Moving Two-Component Liquid Fuel Droplets in Pre-Vaporizer Systems**
S. Raghuram, IIT Madras; Vasudevan Raghavan, Indian Institute of Technology Madras

**GTIndia2012-9681 – Experimental Investigations of an Industrial Lean Premixed Gas Turbine Combustor with High Swirling Flow**
Ivan R. Sigfrid, Thermal Power Eng., Lund University; Ronald Whiddon, Lund University; Robert Collin, Lund University; Jens Klingmann, Thermal Power Eng., Lund University; Abdallah Abou-Taouk, Chalmers University of Technology
Session Details

**STEP 1**

**Track: Structures & Dynamics**

*3-3 Fatigue and Fracture II*

*Session Chair: Baskaran Bhuvaraman, GE India Technology Center*

**GTIndia2012-9691** – *An Assessment of Centrifugal Loading Effect of Rotor Disc on Fretting Variables at a Dovetail Interface of an Aero-Engine*

Anandavel Kaliyaperumal, InfoTech Enterprises Limited; Raghu V Prakash, Indian Institute of Technology Madras

**GTIndia2012-9557** – *Investigations into the Creep Behavior of Gas Turbine Component Assemblies*

K S Raghavan, Infotech Enterprises Limited

**GTIndia2012-9690** – *Effects of Disk Geometry on Strength of a Centrifugal Compressor Impeller for a High Pressure Ratio Turbocharger*

Xinqian Zheng, Tsinghua University; Yangjun Zhang, Tsinghua University; Fenghu Liu, FuYuan Turbochargers Co., Ltd; Huihua Qian, SinoTurbo Power Co., Ltd; Lei Jin, Tsinghua University

**GTIndia2012-9633** – *Improved Analytical Model for Bolted Joint Evaluation in Gas Turbines*

Prasanna Kumar HS, Indian Institute of Technology; Mayuram MM, Indian Institute of Technology/Madras; K S Raghavan, Infotech Enterprises Limited

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**STEP 2**

**Track: Gas Turbine System Operability & Performance**

*4-1 Performance I*

*Room Name: Champagne II*

*Session Chair: Amitava Datta, Jadavpur University*

**GTIndia2012-9580** – *Part-Load Performance of Gas Turbines-Part I: A Novel Compressor Map Generation Method Suitable for Adaptive Simulation*

Elias Tsoutsanis, Qatar University; Yiguang Li, Cranfield Univ; Pericles Pilidis, Cranfield University; Michael Newby, Manx Electricity Authority

**GTIndia2012-9581** – *Part-Load Performance of Gas Turbines-Part II: Multi-Point Adaptation with Compressor Map Generation and GA Optimization*

Elias Tsoutsanis, Qatar University; Yiguang Li, Cranfield Univ; Pericles Pilidis, Cranfield University; Michael Newby, Manx Electricity Authority

**GTIndia2012-9599** – *Form Factor for The Top-Level Comparison of the Condition of Supply of High Pressure-Compressor Blades*

Marcus Schrade, Institute of Aircraft Propulsion Systems, University of Stuttgart; Matthias Voigt, Institute of Fluid Mechanics, Technical University of Dresden; Matthias Weissschuh, Rolls-Royce Deutschland Ltd & Co KG; Stephan Staudacher, Institute of Aircraft Propulsion Systems, University of Stuttgart

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**STEP 3**

*IGTI India Chapter Meeting... 1:00 - 1:20 pm Champagne II*

*Please join us for a meeting to establish the IGTI India Chapter.*
Session Details

SATURDAY, DECEMBER 1, 2012 | 13:30 to 15:30

TRACK: AERODYNAMICS

1-2 Axial Compressors II

Session Chair: S Kishore Kumar, Gas Turbine Research Establishment (GTRE), DRDO

Room Name: Burgundy

GTIndia2012-9565 – Numerical Simulation of Effects of Tip Geometry on the Performance of an Axial Compressor
Hongwei Ma, Beihang University; Jun Zhang, Beihang University

GTIndia2012-9601 – Effect of J-Shaped Casing Treatment on Flow Stability and Performance of an Axial Compressor
Ramjan Pathan, M S Ramaiah School of Advanced Studies, Bangalore; Prof Nagpurwala QH, M S Ramaiah School of Advanced Studies, Bangalore; Ananthesha Bhat, M S Ramaiah School of Advanced Studies, Bangalore

GTIndia2012-9657 – A Novel Approach To Design Reversible Counter Rotating Aerial Fans
Morteza Abbaszadeh, Urmia University; Ramin Taheri, Sharif University of Technology; Parvin Nikpour, Sharif University of Technology

GTIndia2012-9684 – The Effect of Changing the Stator Reduced Frequency in a Compressor Cascade on Transition and Separation in the Leading Edge Region
Samuel Perkins, University of Tasmania; Alan Henderson, University of Tasmania

GTIndia2012-9643 – A Strategy for Multi-Point Compressor Blading Using Multi-Objective Optimization
Alireza Fathi, K. N. Toosi University of Technology; Abdollah Shadaram, K.N.T. University; Mohammad Alizadeh, University of Tehran
The multidisciplinary ASME 2013 Turbine Blade Tip Technical Symposium & Course Week will address the current state of the art in the design, analysis, and improvement of turbine blade tips. Despite decades of applied research, the issue of blade tip burnout has remained as one of the most intractable in gas turbines. Yet the degradation of blade tips continues to represent a large fraction of the turbine losses, both in terms of the operational aero-thermal efficiency and the engine life cycle maintainability. A two-day course of lectures will precede the technical symposium to provide background, state-of-the-art design, and operability issues surrounding the topic. A two-day symposium will build upon the lecture series with current proposed or enacted solutions, studies to gain insight to the physics, and an industry panel session for open discussion. Interested attendees can register for the course only, symposium only, or for both parts of the event.

**Topic of Lectures and Symposium...**

- Turbine blade tip steady and unsteady aerodynamics
- Turbine blade tip heat transfer, internal, external, and film cooling
- Unshrouded and shrouded blade tip design
- Clearance effects and clearance control
- Blade tip or shroud surface treatments and abradable coatings
- Operational steady and transient effects
- Service and repair requirements and issues
- Turbine stage losses and downstream effects
- New or modified designs and innovations
- Propulsion and power generation gas turbines
- Axial and radial turbines
- Experimental and numerical

**Call for Papers... Abstract Deadline: January 28, 2013**

**For further information...**
Please visit the ASME Turbine Blade Tip Symposium & Course Week website at: http://asmeconferences.org/TBTS2013/ or contact the ASME International Gas Turbine Institute (IGTI): Email: igtiprogram@asme.org | Phone: +1-404-847-0072
Session Details

**TRACK: AERODYNAMICS**

### 1-6 Axial Turbines II

**Session Chair:** Hiteshkumar Mistry, GE Global Research  
**Session Co-Chair:** Senthil Kumaran, National Aerospace Laboratories

**GTIndia2012-9641** – Effects of Blade Manufacturing Deviations on Turbine Performance  
Mohammad Alizadeh, University of Tehran; Alireza Fathi, K. N. Toosi University of Technology

**GTIndia2012-9659** – Transpiration Boundary Conditions for a Steady Inverse Method  
Jinguang Yang, Northwestern Polytechnical University; Hu Wu, Northwestern Polytechnical University

**GTIndia2012-9730** – Numerical Studies on Aero-Thermal Performance for a Single Stage Turbine with Variable Rotor-Stator Axial Gap Using Steady and Harmonic Model  
Sathish Kumar Sunnam, Honeywell Technology Solutions; Sridhar Murari, Honeywell Technology Solutions; Ramakumar Bommisetty, Honeywell Technology Solutions

**GTIndia2012-9589** – Parametric Study of Axial Flow Turbine for Mean-Line Design and Blade Elements  
Ramanamurthy Seepana, Gas Turbine Research Estb.; S. Kishore Kumar, Gas Turbine Research Estb.

**GTIndia2012-9510** – Steam Turbine Rotor Blade Cascades Aerodynamic Performance Research at Off-Design Incidence  
Ziming Feng, Northeast Petroleum University; Gu Hui-Bin, Northeast Petroleum University; Zhang Jin-Dong, Northeast Petroleum University

**GTIndia2012-9650** – Investigation of Outlet-Pressure Adaptation Mechanisms for Steam-Turbine Rotor Section  
Hossein Beheshti Amiri, Amirkabir University (Tehran Polytechnic); Mohammad Jafar Kermani, Amirkabir University of Technology (Tehran Polytechnic); Aliakbar Piroozi, Iran University of Science and Technology

### 1-7 Intakes & Ducts

**Session Chair:** Ravichandran Srinivasan, PES Institute of Technology  
**Session Co-Chair:** Ashok Gopinath

**GTIndia2012-9506** – Aerodynamic Shape Optimization of Air-Intakes of a Helicopter Turboshaft  
Ernesto Benini, University of Padova; Andrea Garavello, HIT09 Srl; Claudio Comis, University of Padova; Rita Ponza, HIT09 Srl; Marco Russo, HIT09 Srl

**GTIndia2012-9541** – Numerical Analysis of Flow in S-Duct Diffusers With and Without Flow Control  
R.K. Sullerey, Indian Institute of Technology; Sourabh Bhat, University of Petroleum and Energy Studies

**GTIndia2012-9547** – Annular Supersonic Ejector Design and Optimization  
SathiyaMoorthy K, National Aerospace Laboratories; Venkat S lyengar, National Aerospace Laboratories; Manjunath P, National Aerospace Laboratories

**GTIndia2012-9555** – Simulations of 3-D Separation in a Diffuser  
Amitkumar Shende, InfoTech Enterprises Limited; Manoj Verma, Infotech Enterprises Limited; Trilok Vashist, Infotech Enterprises Limited; Joseph Mathew, Indian Institute of Science

**GTIndia2012-9615** – CFD Simulation of Steam Ejector System in High Altitude Test Facility  
Venugopal Dadi, JNTU Hyderabad; Kishenkumar Reddy, Jawaharlal Nehru; P. Bharamara, JNTU College of Engineering; Pavani Sreekireddy, JNTU Hyderabad

**GTIndia2012-9648** – Cost-effective Hybrid RANS-ILES Method for Jet Turbulence and Noise Prediction  
Mahak M., University of Cambridge; Prasun K. Ray, Imperial College; Paul G. Tucker, University of Cambridge

Room Name: Bordeaux

Room Name: Olio
Session Details

**Track: THERMAL**

**2-5 Droplets and Atomization**

Session Chair: Sreedhara S, IIT

GTIndia2012-9544 – Numerical Investigation of High Pressure Hydrogen Released in Air
U Umesh, Indian Institute of Technology Kanpur; Ashoke De, Indian Institute of Technology Kanpur; Dr. Malay Das, Indian Institute of Technology Kanpur

GTIndia2012-9549 – Effective Radiation Modeling Technique for Transient Temperature Prediction of Gas Turbine Components

GTIndia2012-9604 – Experimental Characterization of Premixed Flame in Gas Turbine Combustor with Spectroscopy and RGB Analysis
Arkadeep Kumar, Jadavpur University; Kamalika Chatterjee, Jadavpur University; Swarnendu Sen, Jadavpur University; Achintya Mukhopadhyay, Jadavpur University

GTIndia2012-9605 – Effect of a Confined Outer Air Stream on Instability of an Annular Liquid Sheet Exposed to Gas Flow
Souvik Chatterjee, Jadavpur University; Koushik Ghosh, Jadavpur University; Swarnendu Sen, Jadavpur University; Achintya Mukhopadhyay, Jadavpur University; Samiran Samanta, Jadavpur University

GTIndia2012-9539 – Phenomenon of Flow Pumping Through Counterbore Cavities
S. Sendilkumar, GE India Technology Centre Pvt Ltd; Karthik Srinivasan, QuEST Global

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It’s not often technology inspires art. This artwork from the Kutch region captures the positive influence of GE wind power on communities across India. Lighting up homes and improving the quality of lives. Just another way GE works to help power India. [www.ge.com/in](http://www.ge.com/in)
Session Details

**TRACK: GAS TURBINE SYSTEM OPERABILITY & PERFORMANCE**

**4-2 Operability**

*Room Name: Champagne II*

**Session Chair:** Vikas Mishra, L&T Power

Arul Jothi B, Combat Vehicles Research and Development Establishment; Junaid Basha AM, Combat Vehicles Research and Development Establishment

Riccardo Ferraro, Università degli Studi di Firenze; Carlo Carasci, University of Florence

GTIndia2012-9685 – Filtration of Gas Turbine Lube Oil Using Anti-Static Filters
Khalid Farooq, Pall Corporation; Meghdoot Arwindekar, Pall Corporation

GTIndia2012-9703 – Towards Development of a Diagnostic and Prognostic Tool for Civil Aero-Engine Component Degradation
Nqobile Khani, Cranfield University; Clara Segovia, Cranfield University; Ritindar Singh, Cranfield University; Rukshan Navaratne, Cranfield University; Vishal Sethi, Cranfield University; Pericles Pilidis, Cranfield University

**GTIndia2012-9742 – Experimental Investigation of Methane Lean Blowout Limit; Effects of Dilution, Mass Flow Rate and Inlet Temperature**

Parisa Sayad, Department of Energy Sciences, Lund University; Alessandro Schonborn, Department of Energy Sciences, Lund University; Denny Clerini, University of Perugia; Jens Klingmann, Thermal Power Eng., Lund University

**GTIndia2012-9622 – Development of a Low Varnish & Long Life Gas Turbine Oil**

James Hannon, ExxonMobil Fuels, Lubricants & Petroleum Specialties Company; Andrea Wardlow, ExxonMobil Research & Engineering; Jessica Prince, ExxonMobil Research & Engineering

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**TRACK: AERODYNAMICS**

**4-8 Combustors**

*Room Name: Bordeaux*

**Session Chair:** Govardhan M, Indian Inst of Technology Madras

**Session Co-Chair:** Shailesh Bhaisora

GTIndia2012-9520 – Effect of Inlet Tangential Port Area on the Performance of Small Scale Simplex Atomizer
Muthu Selvan, National Aerospace Laboratories; Kumaran S, Anna University; Magesh R, Anna University; Dinesh Kanth TP, National Aerospace Laboratories; Vinod Kumar Vyas, National Aerospace Laboratories; Muralidhara H S, National Aerospace Laboratories

GTIndia2012-9538 – Effect of Casing Geometry on Flow Characteristics in a Model Can-Combustor
Abdur Rahim, Jamia Millia Islamia; Prabal Talukdar, Indian Institute of Technology; Dhirgham Alkhafagiy, University of Babylon

GTIndia2012-9674 – Studies on Optimization of a Liquid Fuel Based Low Emission Combustor
Vanteru Mahendra Reddy, IIT Bombay; Darshan Sawant, IIT Bombay; Sudarshan Kumar, IIT Bombay
**SESSION DETAILS**

**TRACK: THERMAL**

**1-10 Film Cooling I**

Session Chair: Andallib Tariq, Indian Institute of Technology Roorkee

- **GTIndia2012-9568** – Second Law Efficiency of an Intercooled-Reheated-Regenerative Brayton Cycle with Variable Temperature Heat Reservoirs
  Vishal Anand, Infotech Enterprises Limited; Krishna Nelanti, Infotech Enterprises Limited; Kamlesh Gujjar, Infotech Enterprises Limited
- **GTIndia2012-9577** – Unsteady RANS Simulation of Film Cooling Jets in a Cross-Flow with an Improved K-Tau Model
  Asif Hoda, International Islamic University; Sumanta Acharya, Louisiana State University
- **GTIndia2012-9578** – Development of an Improved K-Tau Model for Film Cooling Applications
  Asif Hoda, International Islamic University; Sumanta Acharya, Louisiana State University
- **GTIndia2012-9644** – Flow and Heat Transfer Analysis of Turbine Blade Cooling Passages Using Network Method
  Mohammad Alizadeh, University of Tehran; Ali Izadi, University of Tehran; Alireza Fathi, K. N. Toosi University of Technology; Hiwa Khaledi, Sharif University of Technology

- **GTIndia2012-9578** – Effect of Erodent Particle Initial Velocity on the Erosion of Propeller Blades for Turboprop Engines
  Mohamed B. Farghaly, Institute of Aviation Engineering and Technology; Ahmed F. El-Sayed, Zagazig University, Egypt; Galal B. Salem, Cairo University, Egypt
- **GTIndia2012-9651** – Investigation of Geometry, Total Condition and Waves Effect on Two Phase Liquid-Vapor Flow Using Equilibrium Thermodynamics
  Hossein Beheshti Amiri, Amirkabir University (Tehran Polytechnic); Aliakbar Piroozi, Iran University of Science and Technology; Mohammad Jafar Kermani, Amirkabir University of Technology (Tehran Polytechnic); Sabah Hamidi, Department of Mechanical & Aerospace Engineering, Science & Research Branch, Islamic Azad University

**TRACK: AERODYNAMICS**

**1-10 Wind Turbines & Propellers II**

Session Chair: L Venkatakrishnan, National Aerospace Laboratories
Session Co-Chair: Vidyadhar Mudkavi

- **GTIndia2012-9741** – Wave Rotor Pressure Gain Combustion Analysis for Power Generation and Gas Turbine Applications
  Manikanda Rajagopal, Indiana University – Purdue University Indianapolis; Abdullah Karimi, Indiana University – Purdue University Indianapolis; M Razi Nalim, Purdue University
- **GTIndia2012-9733** – Numerical Simulation of the Aerodynamic Behavior of Propellers Blades at Subsonic Conditions
  Mohamed B. Farghaly, Institute of Aviation Engineering and Technology; Ahmed F. El-Sayed, Zagazig University, Egypt; Galal B. Salem, Cairo University, Egypt
- **GTIndia2012-9731** – Effect of Erodent Particle Initial Velocity on the Erosion of Propeller Blades for Turboprop Engines
  Mohamed B. Farghaly, Institute of Aviation Engineering and Technology; Ahmed F. El-Sayed, Zagazig University, Egypt; Galal B. Salem, Cairo University, Egypt
- **GTIndia2012-9733** – Numerical Simulation of the Aerodynamic Behavior of Propellers Blades at Subsonic Conditions
  Mohamed B. Farghaly, Institute of Aviation Engineering and Technology; Ahmed F. El-Sayed, Zagazig University, Egypt; Galal B. Salem, Cairo University, Egypt

Room Name: Gadda Da Vida

Room Name: Olio

**Session Details**

**TRACK: THERMAL**

**2-1 Film Cooling I**

Room Name: Gadda Da Vida

Session Chair: Andallib Tariq, Indian Institute of Technology Roorkee

- **GTIndia2012-9568** – Second Law Efficiency of an Intercooled-Reheated-Regenerative Brayton Cycle with Variable Temperature Heat Reservoirs
  Vishal Anand, Infotech Enterprises Limited; Krishna Nelanti, Infotech Enterprises Limited; Kamlesh Gujjar, Infotech Enterprises Limited
- **GTIndia2012-9577** – Unsteady RANS Simulation of Film Cooling Jets in a Cross-Flow with an Improved K-Tau Model
  Asif Hoda, International Islamic University; Sumanta Acharya, Louisiana State University
- **GTIndia2012-9578** – Development of an Improved K-Tau Model for Film Cooling Applications
  Asif Hoda, International Islamic University; Sumanta Acharya, Louisiana State University
- **GTIndia2012-9644** – Flow and Heat Transfer Analysis of Turbine Blade Cooling Passages Using Network Method
  Mohammad Alizadeh, University of Tehran; Ali Izadi, University of Tehran; Alireza Fathi, K. N. Toosi University of Technology; Hiwa Khaledi, Sharif University of Technology
Session Details

**TRACK: STRUCTURES & DYNAMICS**

**3-1 Fatigue and Fracture I**

Session Chair: K S Raghavan, Infotech Enterprises Limited

GTIndia2012-9518 – **Finite Element Transient Dynamic Analysis of Delaminated Composite Conical Shells Subject to Low Velocity Impact**

Sudip Dey, Jadavpur University, Kolkata, India; Manoj Roy, Mechanical Engineering Department, Jadavpur University, Kolkata; Amit Karmakar, Jadavpur University, Kolkata, India

GTIndia2012-9587 – **Review of the State of Art in the Life Evaluation Technologies of Gas Turbine Parts**

Murugesan Seerangan, GE India Tech Centre Pvt Ltd; Jalindar Walunj, GE India Technology Center; Kishore Kumar Somayajula, GE India Technology Center

GTIndia2012-9530 – **Optimization of a Centrifugal Impeller for a Small Gas Turbine Engine: A Finite Element Approach**

R K Mishra, Center for Military Airworthiness and Certification; S. Essaki Muthu, Engine and Testbed R&D Centre; S. Dileep, Engine & Test Bed R&D Centre, HAL

GTIndia2012-9590 – **Research on Structural Design and Optimization of Turbine Blade Shroud**

Jiang Fan, Beihang University; Xiuli Shen, Beihang University; Le Han, Beihang University; Rongqiao Wang, Beihang University; Weiwei Zeng, Beihang University; Zhipeng Chang, Beihang University

**TRACK: GAS TURBINE SYSTEM OPERABILITY & PERFORMANCE**

**4-3 Performance II**

Session Chair: Amitava Datta, Jadavpur University

GTIndia2012-9505 – **Performance of a Turboshaft Engine for Helicopter Applications Operating at Variable Shaft Speed**

Gianluigi Alberto Misté, University of Padova; Ernesto Benini, University of Padova

GTIndia2012-9564 – **Defect Diagnosis of Power Plant Gas Turbine Using Hybrid SVM-ANN Method**

Sangmyeong Lee, Posco Energy; Juchang Lim, Posco Energy; Sangbin Lee, Posco Energy; Sanghun Lee, Posco Energy

GTIndia2012-9660 – **Assessment of Gas Turbine Performance in Pre-Combustion IGCC Power Plant**

Ashok Dave, University of Ulster Jordanstown; Sina Rezvani, University of Ulster Jordanstown; Ye Huang, University of Ulster Jordanstown; David McIvieve-Wright, University of Ulster Jordanstown; Neil Hewitt, University of Ulster Jordanstown

GTIndia2012-9693 – **Numerical Modeling of Erosion in Highly-Loaded Axial Flow Fans**

Alessandro Corsini, Sapienza University of Rome; Paolo Venturini, Sapienza University of Rome; Franco Rispoli, Sapienza University of Rome; Anthony Sheard, Flakt Woods

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Discipline Chief & Senior Fellow, Diagnostics, Prognostics and Health Management, Pratt & Whitney

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