



Turbo Expo 2024

Advance Program

JUNE 24-28, 2024

LONDON, ENGLAND

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Welcome to Turbo Expo 2024

It is with immense pleasure that I extend my heartfelt welcome to you on behalf of the organising committee of the 69th ASME Turbo Expo. Our Turbo Expo conferences have been a beacon for sustainability, emphasizing the crucial role of technology in minimizing the environmental impact of propulsion and energy. The urgency of our collective journey towards a sustainable future cannot be overstated. Since 2019, our plenary and keynote speakers have deliberated on challenges, scenarios, and presented potential solutions, mapping out the trajectory towards achieving the 2050 Net Zero goals. Time, as they say, flies swiftly, and in the six years that have passed, we've already traversed nearly a fifth of the time allocated until 2050. ASME Turbo Expo 2024 invites each of you to pause from your daily endeavours, and collectively reflect on our progress thus far.

Have we indeed traversed 20% of this transformative journey? More importantly, are adjustments necessary for us to stay on course and achieve our objectives within the stipulated time frame?

The theme that underscores the Keynotes and Plenary sessions is a conversation over achievements and enablers towards net zero in propulsion and power. The keynote on Monday will bring leaders in industry, government, and academia to start this dialogue. The plenary on Tuesday will focus on achievements on the journey towards net zero and sustainability, aiming to focus on actual delivery rather than on future plans and projections. We will delve into the most disruptive technologies such as electrification, hydrogen, and other innovative solutions that transcend the realm of traditional gas turbine technology. Then the Wednesday plenary will discuss the ecosystem beyond the GT technology that enables the success of the products and solutions towards net-zero such as green energy to produce low carbon synthetic fuels and its scale up, CO₂ capture (DAC -Direct Carbon capture), certification and regulations, economics

of scale etc. These discussions and exchanges will be instrumental in shaping our collective roadmap, steering us toward a future where sustainability and innovation coalesce seamlessly.

The Turbo Expo awards ceremonies, where winners of ASME and ASME IGTI awardees are honoured, will be held with the during the keynote and plenaries. Please visit the ASME website for a description of these awards and the distinguished recipients. The Expo Hall will feature over 100 exhibitors and about 40 student posters from Tuesday at lunch through the closing ceremony Thursday after lunch.

The success of this conference rests on the synergy of ideas, the spirit of collaboration and the dedication of every participant. I would like to acknowledge the hard work of many, from the ASME staff to the large number of willing and dedicated volunteers. On behalf of the ASME Turbo Expo Organizing Committee, we wish to thank our sponsors who have so generously contributed to the success of this event. Also, we wish to acknowledge the dedicated service of our Executive Conference Chair Raul Vazquez; Technical Program Tom Verstraete; the Review Chair Andrew Nix; the Vice Review Chairs Marc Polanka, Shahrokh Shahpar and Rudy Dubebout; Tutorial Team Ioanna Aslanidou and Stephen Spence; Representative to the IGTI Executive Committee Natalie Smith; and our Local Liaison Committee Chairs Sina Stapelfeldt and Teng Cao. Special thanks to the keynote and plenary speakers and moderators, who volunteered their time and contributed to the discussion of achievements and enablers towards Net Zero. Turbo Expo is the world's premier gas turbine technology event, enabled by the dedicated time and effort given by the authors, reviewers, session chairs, committee leaders, and ASME staff. Thank you.

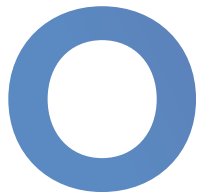
I hope you will be energised by the vibrancy of London, as well as by the technical content and the networking possibilities that form the trademark of this five-day conference. Thank you and see you in London.



Ricardo Martinez-Botas

*Conference Chair
Imperial College London*

Welcome to Turbo Expo 2024



On behalf of the organising team, it is with immense pleasure and honour that I extend a warm welcome to each of you to ASME Turbo Expo 2024, to be held in the vibrant and historic city of London.

London, a city steeped in history and renowned for its blend of tradition and innovation, serves as a great host for this esteemed gathering. Its cobblestone streets narrate tales of resilience, while its skyline, adorned with modern architectural marvels, embodies the spirit of progress—a fitting backdrop for the exchange of ideas and advancements in turbomachinery technology.

One of the iconic symbols of London, the Tower of London, stands as a testament to the city's rich history; it was constructed in the 11th century and displays the Crown Jewels. The Great Fire of London in 1666 left an indelible mark on the city. The fire ravaged much of London, destroying thousands of homes and iconic landmarks. The iconic Tower Bridge, with its striking Victorian Gothic design, has been a symbol of London since its inauguration in 1894. Meanwhile, the Millennium Bridge, a modern pedestrian suspension bridge, stands as a marvel of contemporary architecture, linking St. Paul's Cathedral to the Tate Modern. Charles Dickens's novels depict the city's streets and society during the Victorian era.

London's diverse neighbourhoods tell stories of immigration and cultural amalgamation. Areas like Chinatown, Little Italy, and Brick Lane bear the imprints of various immigrant communities that have contributed to London's vibrant cultures, cuisines, and traditions.

London's cultural richness is as diverse as its history: the British Museum, the Victoria & Albert Museum, and the Science and Natural History Museums stand out amongst over 200 museums. The over 30 West End's theatres illuminate the city's heritage and showcase performances that attract audiences across the globe.

The United Kingdom has been a cradle of innovation and a nurturing ground for pioneers in the field of engineering and technology. From the Industrial Revolution to present day, this nation has been at the forefront of transformative inventions and breakthroughs. Visionaries like Sir Frank Whittle, credited

as the father of the jet engine, revolutionized propulsion technology, laying the cornerstone for modern turbomachinery.

The UK's legacy in turbomachinery extends beyond Whittle's ground-breaking work. From Sir Charles Parsons' pioneering invention of the steam turbine to Alan Arnold Griffith's contributions to gas turbine engineering, this country has been a fertile ground for minds that have shaped the very essence of turbomachinery technology.

The ASME Turbo Expo stands as a testament to this legacy—a platform that celebrates the legacy of these pioneers while propelling us toward an era of unparalleled innovation. It is a space where the collective brilliance of minds from diverse corners of the world converge, fostering a milieu ripe for collaboration, learning, and exploration.

Our agenda for this Expo reflects the multifaceted nature of turbomachinery technology. From aerodynamics to materials science, from combustion to heat transfer, the sessions and discussions are designed to encapsulate the breadth and depth of this field, inviting all participants to engage and contribute to the discourse.

Moreover, beyond the confines of formal sessions, I encourage each of you to immerse yourselves in the vibrant atmosphere of London. Explore its museums steeped in history, revel in its cultural diversity, and partake in the spirit of innovation that permeates its streets—a perfect complement to the ground-breaking discussions that await within the conference halls.

The success of this Expo is a culmination of the collective effort of numerous individuals, organizations, and partners. Your support and commitment to advancing turbomachinery technology are invaluable, and I extend my heartfelt gratitude to each one of you.

Welcome to London and welcome to the ASME Turbo Expo 2024, where the legacy of pioneers meets the aspirations of tomorrow.

Warm Regards,



Raul Vazquez

*Engineering Aerothermal Fellow
Rolls-Royce plc.*

Sponsors

Thank you to our Sponsors and Exhibitors!
Be sure to visit their booths during the event.

PLATINUM SPONSORS



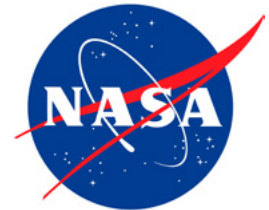
Rolls-Royce



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Attendee Bags



Sponsors

Thank you to our Sponsors and Exhibitors!
Be sure to visit their booths during the event.

ADDITIONAL SPONSORS



Attendee Bags



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MEDIA PARTNERS



Exhibitors

[Click to see the exhibitors and exhibition map.](#)

Make Time to Visit the Exhibition

Take some time to visit the over 100 exhibitors during Tuesday to Thursday of the Conference.



London, United Kingdom



About London

London is the capital and largest city of England and the United Kingdom. It is a 21st-century city with history stretching back to Roman times.

London is filled with diversity and excitement with some of the world's best sights, attractions, and activities. It is also the largest metropolitan economy in the United Kingdom by GDP.



Getting Around London

London is a city with a great public transportation network. Underground or "The Tube" is one of the most common ways to travel to and from central London and is an essential part of many people's stay in the capital. Using an Oyster travel smartcard is the easiest and cheapest way to travel around the city's public transport network. Double-decker buses are another fast, easy, and convenient option to travel across the city with sightseeing opportunities along route.

LONDON TOP ATTRactions

- Big Ben
- Coca-Cola London Eye
- Tower of London
- The View from The Shard
- Sea LIFE London
- Buckingham Palace
- Hyde Park
- Old Spitalfields Market
- Hampton Court Palace
- House of Parliament

Essential Information



Currency

The currency in the United Kingdom is the pound sterling, known as the pound (£, GBP). There are 100 pence (p) to the pound (£).

Notes come in denominations of £5, £10, £20 and £50. Coins come in 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2.



Visa Requirements

Some people may require a visa to visit the United Kingdom.

To find out whether you need a visa to visit London and how to apply, see the [UK Visas and Immigration website](#), or check with your local British Embassy or other diplomatic representative before you travel.



Tipping

It is common to leave 10-15% of the bill at restaurants, however some restaurants add on a service charge instead. It is courteous to top 10-15% of the taxi fare to black cabs and licensed mini cabs.

People normally, do not tip at bars and pubs.



Electricity

It is easy to stay connected in London. UK appliances are fitted with a three-pin plug.

Power sockets deliver an average of 230v.



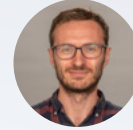
LOCAL LIAISON COMMITTEE



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Sensor Coatings



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Martin White
University
of Sussex



Mark Wilson
Coolbrook



Grand Opening & Awards Information

Awards & Scholarships

ASME Turbo Expo Early Career Engineer (TEECE) Travel Award

The Turbo Expo Early Career Engineer Travel Award (TEECE) is intended for early career engineers working in industry, in government or in academia to obtain travel funding to attend ASME Turbo Expo to present a paper which they have authored or co-authored. The purpose is to provide a way for more individuals to participate in the annual Turbo Expo.

The nominee must have obtained an academic degree (Bachelor, Master, PhD, or equivalent degrees) in an engineering discipline related to turbomachinery within five years from the year of the Turbo Expo that the applicant wishes to attend. The paper or poster being presented can be research results from work completed either while pursuing an academic degree, or after leaving school and entering the job field. Post-doctoral researchers in academic institutions are eligible so long as they have been in post no longer than five years full time equivalent.

TEECE AWARD WINNERS GET

One Complimentary ASME Turbo Expo Technical Conference Registration

Complimentary Hotel Accommodations (Sunday to Friday)

Up to \$1,000
Toward approved travel expenses.

Congratulations to the 2023 TEECE Award Recipients

Lakshya Bhatnagar

Purdue University

Louis Christensen

Slippery Rock University

Luca Fantaccione

Baker Hughes

Vasilis Gkoutzamanis

Aristotle University of Thessaloniki

Jim Hickey

Sensor Coating Systems Ltd

Rory Hine

BAE Systems plc

Richard Hollenbach III

Exponent Scientific and Engineering Consulting

Melissa Kozul

University of Melbourne

Eric Kurstak

GE Aerospace

Oguzhan Murat

von Karman Institute for Fluid Dynamics

Preethi Rajendram Soundararajan

University of Cambridge

Bryan Rodriguez

LA Turbine

Neha Singh

Rolls-Royce

Ananth Sivaramakrishnan Malathi

Indian Institute of Technology Madras

Jose Torres

Boeing

Dung Tran

Energy Recovery Inc.

Ladislav Vesely

University of Central Florida

Alexander Wildgoose

General Electric Aerospace

Peter Wilkins

Pratt & Whitney

[CLICK HERE FOR APPLICATION DETAILS](#)



ASME IGTI Student Scholarship Program

ASME IGTI has a long and proud history of providing scholarships to students who show promise for their future profession in the turbomachinery field. The aim is to attract young talent to the profession and reward their commitment, favoring their upcoming enrollment and active participation. The scholarship is to be used for tuition, books, and other University expenses. The check will be made out to the University on the student's behalf.

ELIGIBILITY

Scholarship recipients are selected based on scholastic ability, character, integrity, leadership, and potential contribution to the mechanical engineering profession.

Applicants must be:

- An ASME student member to access the scholarship portal
- A full-time student enrolled at a university in an ABET accredited program; student in their last year of study, graduating can be part-time
- Enrolled at a community college/2-year technical program or in an associate degree program with an emphasis in mechanical engineering, MET or a closely related discipline. Students can be part-time
- Have financial need

UNDERGRADUATE

Application Deadline **February 15**
Recommendation Deadline **February 22**

GRADUATE

Application Deadline **February 29**
Recommendation Deadline **March 7**

When you complete the online application, you will be considered for all ASME scholarships for which you qualify, not just the ASME IGTI scholarship.

Completing the application one time will afford you the opportunity to be considered for all the scholarships – so do not delay and **complete the application today!**

THE INTERNATIONAL GAS TURBINE
INSTITUTE SCHOLARSHIP AWARDS:

\$2,000 TO **20**
USD HONOREES

More details can be found at go.asme.org/scholarships.



CONGRATULATIONS TO THE 2023-2024 STUDENT SCHOLARSHIP WINNERS:

Emma Anderson
*Montana Technological
University*

Joseph Bertrand
University of Indianapolis

Kimberly Betty
Kettering University

Md Monjur Hossain Bhuiyan
*University of Oklahoma-
Norman Campus*

Ethan Brumberger
*Texas A & M University-
College Station*

Mouhamadou Diop
Kennesaw State University

Coen Fricke
Colorado School of Mines

Noah Greeson
*Oklahoma State University-
Main Campus*

Muhammad Ibraheem
Warsaw University of Technology

Surendra Kolhe
*Indian Institute of
Technology Kharagpur*

Christy Mammen
*Mar Athanasius College
of Engineering*

Peter Ohenhen
University of Nebraska-Lincoln

Calvin Pawlak
Michigan State University

Sowmya Raghu
*University of South
Carolina-Columbia*

Zachary Sakata
University of Idaho

Mark Sedlak
*Pennsylvania State University-
Penn State Erie-Behrend College*

Phillip Smith
*North Carolina A & T
State University*

Dominika Swedek
Cornell University

Shaon Talukdar
The University of Alabama

Kingsley Usifoh
The University of Alabama

STUDENT ADVISORY COMMITTEE TRAVEL AWARD (SACTA)

The Student Advisory Committee Travel Award (SACTA) consists of reimbursement of up to \$2,000 USD for approved expenses to attend and participate in ASME Turbo Expo. The following criteria are considered for the selection of SACTA recipients:

- Be a PhD student until Turbo Expo
- Active involvement in Student Advisory Committee initiatives
- Student Paper Review Initiative
- Poster reviewer
- Technical Committee Liaison
- Publication in Turbo Expo conference and/or journals
- Presenting paper/poster during current Turbo Expo
- Previous Turbo Expo attendance
- Motivation letter showcasing applicant's suitability

Applicants for these awards must be seeking a degree. Preference will be given to students who have previously worked and/or have applied to work as a student liaison for Turbo-Expo. The applicant must agree to participate in the SAC Annual Meeting and be willing to help the SAC leadership team review student posters. Communication with the SAC leadership team may be requested prior to, during, and following Turbo Expo.

[CLICK HERE FOR APPLICATION DETAILS](#)



THE ASME R. TOM SAWYER AWARD

NOMINATION DEADLINE AUGUST 15

The R. Tom Sawyer Award is bestowed on an individual who has made important contributions to advance the purpose of the Gas Turbine Industry and to the International Gas Turbine Institute over a substantial period of time. The contribution may be in any area of institute activity but must be marked by sustained forthright efforts. The award was established in 1972 to honor R. Tom Sawyer who, for over four decades, toiled zealously to advance gas turbine technology in all of its aspects and includes a US \$1000 honorarium and a plaque presented during ASME Turbo Expo.

The nomination must be complete and accompanied by three to five Letters of Recommendation from individuals who are well acquainted with the nominees' qualifications. Candidate nominations remain in effect for three years and are automatically carried over. The completed reference form from a minimum of 3 people will need to be sent in with the nomination package. It is up to the "Nominator" to submit all required information. Email completed nomination package to: igtiawards@asme.org.



Congratulations to the 2023 ASME R. Tom Sawyer Award winner **Karen Thole**.

JOHN P. DAVIS AWARD

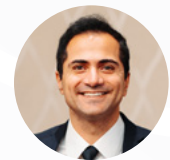
Awarded to a paper that focuses on new or continuing gas turbine applications, identifies planning, installation, operating and/or maintenance problems and their solutions, and exemplifies candid exposure of real-world problems and solutions.

THE ASME GAS TURBINE AWARD

The Gas Turbine Award is given in recognition of an outstanding individual--or multiple--author contribution to the literature of combustion gas turbines or gas turbines thermally combined with nuclear or steam power plants. The paper may be devoted to design aspects or overall gas turbines or individual components and/or systems such as compressors, combustion systems, turbines, controls and accessories, bearings, regenerators, inlet air filters, silencers, etc. It may cover topics specifically related to gas turbines such as high temperature materials or fuel considerations, including erosion and corrosion complications. It can also be devoted to application or operational aspects of gas turbines for aircraft propulsion and ground power units, or automotive, electric utility, gas pipeline pumping, locomotive, marine, oil field pumping, petrochemical, space power, steel, and similar uses. This award was established in 1963 and includes a US \$1000 honorarium and a plaque presented during ASME Turbo Expo.



Congratulations to the 2021 ASME Gas Turbine Award winners **Jinwook Lee, Zoltán S. Spakovszky, Edward M. Greitzer, Mark Dreha, and Jérôme Talbotec**.



Congratulations to the 2023 ASME John P. Davis Award winners **Dale R. Tree, Dustin Badger, Darrel Zeltner, and Mohsen Rezasoltani** for their GT2021-58998 paper: Turbine Inlet Temperature Measurements in a T8200 kw Gas Turbine Using Water Vapor Emission.

THE ASME IGTI AIRCRAFT ENGINE TECHNOLOGY AWARD

NOMINATION & LETTER DEADLINE **OCTOBER 15**

The Aircraft Engine Award recognizes sustained personal creative contributions to aircraft gas turbine engine technology. Eligible areas of accomplishment are aircraft engine design, and/or research and development performed in an industrial, academic or research laboratory environment in one or more of the following fields:

- Aircraft Engine Propulsion
- Airframe-Propulsion Integration
- Combustion & Fuels
- Controls
- Diagnostics
- Heat Transfer
- Manufacturing Materials & Metallurgy
- Operability
- Structures & Dynamics
- Turbomachinery

For application details, visit: [asme.org/about-asme/honors-awards/unit-awards/aircraft-engine-technology-award](https://www.asme.org/about-asme/honors-awards/unit-awards/aircraft-engine-technology-award)



Congratulations to the 2023 Aircraft Engine Technology Award winner **Anestis Kalfas**, the *Aristotle University of Thessaloniki*.

THE ASME IGTI INDUSTRIAL GAS TURBINE TECHNOLOGY AWARD

NOMINATION & LETTER DEADLINE **OCTOBER 15**

The Industrial Gas Turbine Award recognizes sustained personal creative scientific or technological contributions unique to electric power or mechanical drive industrial gas turbine technology. Eligible areas of accomplishment are gas turbine design, application, operations/maintenance, and research/development/deployment, performed in an industrial, academic or research laboratory environment in one or more of the following fields:

- Combustion, Fuels, & Emissions Abatement
- Controls
- Diagnostics
- Electric Power Plant Integration
- Fluid Dynamics & Thermal Sciences
- Operation, Maintenance, & Life Cycle Cost
- Manufacturing, Materials, & Metallurgy
- Structures & Dynamics
- Thermodynamic Cycles
- Turbomachinery

For application details, visit: [asme.org/about-asme/honors-awards/unit-awards/asme-igt-industrial-gas-turbine-technology-award](https://www.asme.org/about-asme/honors-awards/unit-awards/asme-igt-industrial-gas-turbine-technology-award)



Congratulations to the 2023 Industrial Gas Turbine Technology Award winner **Vittorio Michelassi**, *Baker Hughes*.

BOTH AWARDS WILL INCLUDE:



An optional opportunity to deliver a lecture or present an invited technical paper on the work for which the award is being bestowed.

The recipient of each award will very desirably, but not necessarily, be a member of The ASME. Each award will be made to a single individual.

Nominating letters should contain all information on the nominee's relevant qualifications.

The Award Committee will not solicit or consider materials other than those described below. The selection committee will hold nominations active for a period of three years.

A minimum of two supporting letters from individuals, other than the nominator, must accompany the nominating letter.

Supporting letters should reflect peer recognition of the nominee's breadth of experience with various aspects of industrial gas turbine technology.



ASME IGTI DILIP R. BALLAL EARLY CAREER AWARD

NOMINATION DEADLINE AUGUST 1

Early Career Awards are intended to honor individuals who have outstanding accomplishments during the beginning of their careers. Historically, there has been no such award to recognize early career engineers working in the area of turbomachinery.

An early career award is intended for those starting a professional career, which is typically after a relevant terminal degree: BS, MS, or PhD. A criterion of seven-years-from-degree will be used to define the nominee's eligibility. The nominee must receive the award prior to the completion of the seventh year beyond the terminal degree.

The recipient of the Dilip Ballal Early Career Award will be presented with the award at Turbo Expo. The award consists of a plaque, funds to support the travel and registration costs to Turbo Expo, free ASME membership registration for five years, and a US \$2000 honorarium.

The nomination package should include the following:

- A paragraph (less than 50 words) from the nominator highlighting nominee's contributions
- Nomination letter
- Two supporting letters
- Current resume of the nominee

Submit nominations here: asme.org/about-asme/honors-awards/unit-awards/asme-igti-dilip-r-ballal-early-career-award



Congratulations to the 2023 Dilip R. Ballal Early Career Award winner **Raghu Kancherla**.

ASME DEDICATED SERVICE AWARD

NOMINATION DEADLINE AUGUST 1

The ASME Dedicated Service Award honors unusual dedicated voluntary service to the Society marked by outstanding performance, demonstrated effective leadership, prolonged and committed service, devotion, enthusiasm and faithfulness.



Congratulations to the 2023 award winners **Natalie Smith** and **Ricardo Martinez-Botas**.

For details on the 2024 award winners,
please refer to the 2024 Awards Program.

Programs will be available on the Turbo Expo Website.





4. Rotor
Compa
optimiz
• SOA-1 op
small effi
• SOA-2 op
good incr
• AI optimi

Technical Sessions

Technical Sessions

Aircraft Engine

Sessions within this track address issues of interest across a broad spectrum of aircraft engine technology subjects. Presenters will cover a range of topics including:

- Modeling, Simulation and Validation
- Whole Engine Performance and Novel Concepts
- Operability
- Inlets (incl. Boundary Layer Ingestion), Nacelles, Nozzles and Mixers
- Propellers and Open Rotors
- Propulsion System Integration in Conventional and Hybrid-Electric Aircraft
- Thermal Management Systems and Aero-Engine Oil Systems
- Aero-Engine Controls and Diagnostics

Ceramics and Ceramic Composites

Ceramics are important materials for consideration in the extreme environments found in the gas turbine engine hot sections due to their high temperature mechanical and physical properties as well as lower density than metals. The advantages of utilizing ceramic hot section components include weight reduction, improved efficiency as well as enhanced power output and lower emissions. In order to realize the potential of rotating and static ceramic components, some unique technical challenges are being overcome by the engineering community.

Specific areas of research and development include:

- Design, development and processing of monolithic ceramic matrix composite (CMC) Materials
- Development, processing and characterization of Thermal and Environmental Barrier Coatings (TBCs/ EBCs)
- Modeling and validation of material performance
- Life Prediction
- NDE
- Test Methods and standards
- Design and fabrication of components
- Engine & laboratory testing of components

The technical and panel sessions sponsored by the ceramics committee cover breakthrough developments and demonstrations critical for the incorporation of ceramic hot section components for gas turbine engines.

- Ceramic Matrix Composites: Properties and Performance
- Ceramic Matrix Composites: Modeling and Life Prediction

Coal, Biomass, Hydrogen & Alternative Fuels

Sessions focus on high-interest topics in the area of alternative fuel systems for gas turbines, including Hydrogen fuel systems, steam turbines and other turbomachinery technologies. Alternative and renewable fuels including gaseous and liquid hydrocarbon fuels, alcohols and ethers; as well as pure hydrogen, or high hydrogen content fuels. Alternative liquid hydrocarbon fuels derived from coal or biomass feedstocks or other technologies. Technical, tutorial, and panel sessions will cover the fundamental physical and chemical properties of alternate and renewable fuels, important to their use in gas-turbine engines and other power systems, as well as their application in different power systems. Sessions will be of interest to researchers/technologists/computational methods involved in the generation and utilization of non-conventional fuels in gas-turbine-based energy systems and for those wishing to start a new activity in this field.

- Hydrogen Fuel delivery systems
- Hydrogen and hydrogen content fuels for Gas Turbine Applications
- Alternative Fuel Chemistry and Fundamentals
- Alternative Fuel Use in Gas-Turbine Engines
- Basics of Hydrogen and Alternative Fuels
- Liquid Fuel Atomization and Combustion
- Computational Methods for Hydrogen and other Alternate Fuels
- Basics of Combustion Computational Fluid Dynamics

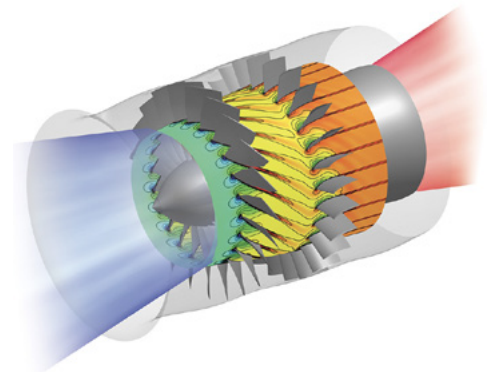


cādence[®]

Accelerate Design Analysis
and Optimization with

Fidelity CFD

Pointwise | Numeca | Cascade



Visit Us at Booth 410
or Schedule a Meeting

Contact Us



Combustion, Fuels & Emissions

Aero and Industrial Gas turbines with low specific fuel consumption and reduced CO₂ emissions require high combustor outlet temperatures with a continued emphasis on reducing emissions, without sacrificing operability or durability. In addition, Combustion systems are increasingly expected to operate with synthetic gaseous fuels or alternative liquid fuels, including novel fuels such as hydrogen or ammonia. The Combustion, Fuels & Emissions sessions will highlight new technology and design approaches, using both experimental and computational techniques, employed to achieve improved combustor performance including ultra-low pollutant emissions and enhanced operability such as turndown and transient response. Broad trends include a continued focus on combustion dynamics for lean-staged combustion systems, significant innovation in the development of combustion system such as Dry Low NO_x or novel rotary detonation, maturation of large eddy simulation analyses, as well as continued research of fundamental and applied topics in automation, mixing, ignition, autoignition, blowout and chemical kinetics.

Technical sessions include:

- Ignition & Auto ignition
- Atomization & Sprays
- Fundamental Combustion
- Novel Combustion Concepts
- Flashback & Blowout
- Pollutant Emissions Formation & Control: Combustor Performance
- Combustor Design & Development
- Chemical Kinetics
- Combustion Noise
- Pollutant Emissions: Modeling, Soot and Particulates
- Combustion Dynamics: Basic Mechanisms, Flame Response to Perturbations, Instability, Analysis, Model Development and Damping & Control
- Combustion Modeling: Combustor Simulations and Large Eddy Simulations
- High Hydrogen Combustion
- Dry Low-NO_x Combustor Development
- Micro Devices
- Jet-in-crossflow & Swirling Flows
- Combustor Diagnostics

Controls, Diagnostics & Instrumentation

The Controls, Diagnostics & Instrumentation Committee will host technical, panel and tutorial sessions that will closely examine the global challenges associated with Gas Turbine Engine Technology. These will include the latest developments in gas turbine engine control, prognostics, diagnostics and health management, artificial intelligence, and instrumentation technology, and the impact these technologies have in enabling more efficient and reliable engines, lowering engine emissions, and reducing engine operating costs. More precisely, the exchange of information between experts from Government, Academia and Industry is promoted on the following topics:

- Control System Technology
- Optimal and Intelligent Controls
- Active Component Control
- Distributed Engine Control
- Engine Health Management
- Gas Path Performance Diagnostics
- Structural and Mechanical Component Health Management
- On-Board Engine Monitoring and Diagnostics
- Prognostics for Gas Turbine Engines
- Modeling for Controls and Diagnostic Applications
- Life Usage Monitoring and Life Extending Control Algorithms and Sensors
- Optical and Non-intrusive Measurement Techniques
- Flow, Temperature, Pressure and Acoustic Instrumentation
- Advanced Data Reduction Methods
- Integrated Controls and Diagnostics
- Novel Sensors and Sensor Technologies
- Development of Standard and High Temperature Test Rigs and Probes



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Cycle Innovations

The Cycle Innovations Committee is dedicated to the advancement of technology and innovation, with a particular focus on the thermodynamic cycles of gas turbine–based plants for power generation and propulsion. Special attention is also devoted to energy storage technology and management aspects. The Committee traditionally attracts paper submissions from a wide range of disciplines and scientific areas. Some of the thematic areas the Committee currently encompasses are listed below:

- Low or no emissions thermal cycles
- H₂ production and utilization
- Polygeneration cycles and process integration (power, heat, cooling, fuels, chemicals) for centralized and distributed power generation
- Advanced steam and humid air cycles
- (Semi)-Closed cycle gas turbine technology
- Novel propulsion systems for aircraft, rotorcraft and marine
- Innovative low and high temperature heat recovery cycles
- Renewable and bio-energy concepts and innovative cycles
- Fuel cell driven cycles and hybrid systems
- Externally fired gas turbines and high temperature heat exchangers
- Externally fired gas turbines and high temperature heat exchangers
- Thermo-economic and environmental impact analysis
- Cycle simulation and analysis for performance and health assessment
- Innovative control systems for power plants
- Optimization of traditional and innovative energy and propulsion systems

Objectives:

Authors and presenters are invited to participate in this event to expand international cooperation, understanding and promotion of efforts and disciplines in the area of Cycle Innovations. Dissemination of knowledge by presenting research results, new developments, and novel concepts in Cycle Innovations will serve as the foundation upon which the conference program of this area will be developed.

A variety of sessions are available for presentations as it allows flexibility to the authors. All sessions are quality driven.

Education

Sessions encompass gas turbine/ turbomachinery education both in the university and in industry. Specific teaching tools and techniques will be discussed, including web-based and large-scale remote education, along with industry opportunities for gas turbine engineers. Anyone interested in gas turbine/turbomachinery engineering education is welcome, from students to PhDs. Academics will be exposed to ideas and best practices being used at other institutions as well as innovative approaches for gas turbine/turbomachinery education. Industry will have an opportunity to interact with educators to discuss relevant topic areas and to express the expectations with regard to changing needs. Discussions here have the potential to influence engineering education for a positive impact on future engineers. The sessions provide an active and constructive dialogue about gas turbine/ turbomachinery education among practitioners from the industry, students, educators and researchers.

Electric Power

The Electric Power Committee promotes the exchange of significant technical information about the application and operation of gas turbine power plant systems. This committee organizes panels and technical sessions that deal with the gas turbine as a major component of a power plant, its integration into the power plant and optimization of power plant components, as well as optimization of the overall plant. Paper sessions on these topics will be complemented by panel sessions to address current topics of the gas turbine industry. Presenters will include owner/operators, original equipment manufacturers and industry service providers.

The EPC sessions will include the following:

- The Pathway Forward: Future Gas Turbine Products & Technologies– OEM Perspective
- Voice of the Customer: User Experience with Gas Turbine Technology
- Gas Turbine Developments
- Combined Cycle Power Plants
- Enabling Technologies
- Gas Turbine Industry Updates
- Tutorial: Managing Operational Risks

Energy Storage

The mission of the committee is to provide opportunities for knowledge dissemination and professional networking related to non-battery energy storage for industry, academia, and government. The focus of these activities is on turbomachinery-based energy storage systems. Technical and panel sessions and tutorials on the following topics are welcomed: General Energy Storage, Pumped Heat (Thermal) Energy Storage, Carnot/Brayton Batteries, Compressed Air Energy Storage, Liquid Air Energy Storage, Pumped Hydro Energy Storage, Power plants including thermochemical energy storage in the form of synthetic fuels (energy vectors), Flywheel Energy Storage, Hybrid Energy Storage combining different power generation and energy storage technologies (photovoltaics, gas/steam turbines, thermal energy storage...). Even though the focus of the committee is on non-battery energy storage, hybrid energy storage systems incorporating batteries are of interest for the committee. The Energy Storage Committee provides an excellent forum for industry, academic and governmental institutions to discuss and exchange ideas within the general scope of energy storage.

Fans and Blowers

Improvements in fans and blowers are means to address the global energy challenge, with manufacturers increasingly focusing on improvement in fan efficiency under legislative pressure and as a part of their response to global climate change.

The academia-industry collaboration and the up-front use of Computational Fluid Dynamics (CFD) and Experimental Fluid Dynamics (EFD) are the key ingredients to facilitate the advancement from traditional empirical design methodologies. In response to these challenges, the ASME-IGTI Fans and Blowers Technical Committee consider all technical aspects associated with fans and blowers, with a special emphasis on:

- Design and optimization
- CFD and Artificial Intelligence methods for unsteady aerodynamics
- Noise generation, prediction, innovative noise reduction design
- Experimental challenges in- and out-of-lab
- Structural mechanical aspects (vibration, fatigue and flutter)
- Operations and system effects and interactions
- Maintenance, repair & life-time management
- Standards, compliance with legislation & regulations
- Smart industrial applications of fans and blowers
- Fan solutions for improved indoor air quality

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Heat Transfer: Combustors

This track is jointly sponsored by the Heat Transfer and Combustion, Fuels & Emissions committees and includes all research activities in the area of combustor related heat transfer and cooling as well as topics related to combustor-turbine interactions. Papers describing research and technical advances in this area are invited to be submitted to this track.

Relevant topic areas include:

- Experimental, analytical, and numerical studies of heat transfer in combustors, including combustor liners, dome/splash plate, injector tip, and backside cooling of combustor liners
- Studies on new cooling designs for low-NO_x combustors, liners, and dome/splash plate
- Combustor simulators to study the impact of hot combustor exit flow on hot gas path components

Heat Transfer: Film Cooling

Papers describing research and technical advances in application of film cooling in turbomachinery are invited to be submitted to this track.

Relevant topic areas include:

- Blade/Vane Leading Edge Film Cooling
- Blade/Vane Trailing Edge Film Cooling
- Vane End-Wall Film Cooling
- Blade Platform Film Cooling
- Blade Tip Film Cooling
- Novel Film Cooling Designs
- Film Cooling Design Optimization
- Unsteady Effects in Film Cooling
- Effusion Film Cooling
- Deposition Effects on Film Cooling

Heat Transfer: General Interest / Additive Manufacturing Impacts on Heat Transfer

Papers describing research and technical advances in the area of heat transfer in turbines which do not fit into blades/vanes internal and film cooling applications are invited to be submitted to this track.

Relevant topic areas include:

- Gas-path heat transfer
- Vane end-wall and blade tip/platform heat transfer
- Probabilistic methods in heat transfer analysis
- Experimental methods for heat transfer
- Numerical analysis of heat transfer
- Design tool development and validation
- Rotational effects on heat transfer
- Additive manufacturing impacts on heat transfer
- Radiation heat transfer
- Multimode heat transfer
- Heat exchangers and recuperators
- Innovative concepts relating to heat transfer

Heat Transfer: Internal Air Systems

This track is jointly sponsored by the Heat Transfer and Turbomachinery committees and includes both fluid dynamics and heat transfer aspects of turbomachinery internal air systems and seals. Papers describing research and technical advances in this area are invited to be submitted to this track.

Relevant topic areas include:

- Actively controlled sealing systems
- Internal air & seal, experimental, analytical, and numerical studies of flow and heat transfer phenomena in rotating cavities, rotor/stator systems and seals
- Heat transfer in rotor support and oil systems
- Secondary air systems analysis involving component interactions and system performance
- Two-phase flow phenomena in internal air systems involving oil jet and oil film disintegration, oil migration in secondary air systems and air/oil interaction including heat transfer, oil fires, film flows, bearing chamber and gearbox flows

Heat Transfer: Internal Cooling

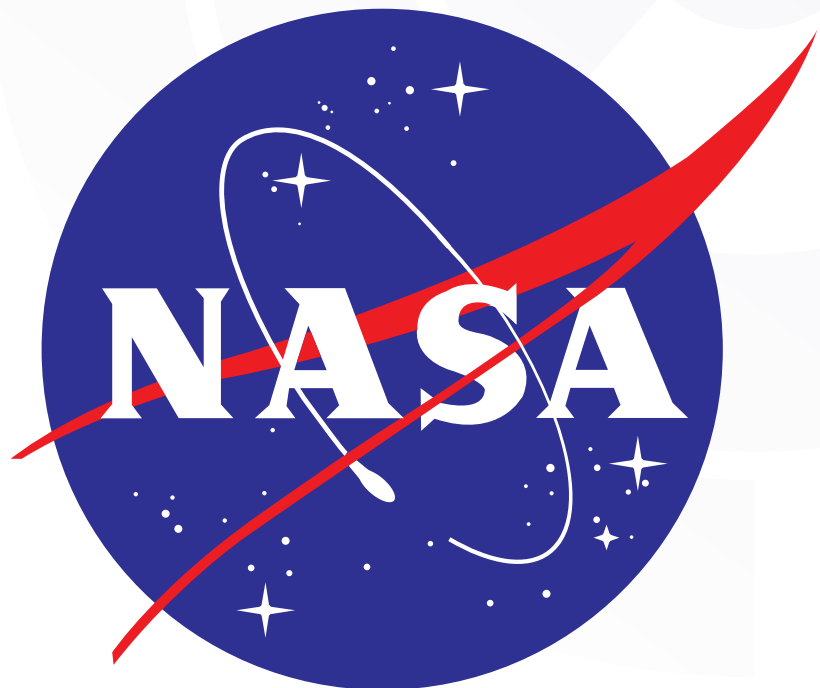
Papers describing research and technical advances in internal cooling schemes for turbomachinery components are invited to be submitted to this track.

Relevant topic areas include:

- Blade/vane internal cooling
- Internal cooling with impingement
- Internal cooling with heat transfer augmentation devices such as turbulators/pin-fins
- Internal cooling design optimization
- Innovative internal cooling designs
- Numerical studies of internal cooling
- Validation studies in internal cooling
- General internal cooling

Heat Transfer: Tutorials

Two heat transfer tutorials will be offered at Turbo Expo 2024. One will describe the techniques and intricacies of computing and measuring heat transfer coefficients in turbine relevant flows. Another tutorial will offer a review of advanced technology for internal cooling of turbine blades and vanes.



Industrial & Cogeneration

Representing gas turbine applications within the cogeneration and process industries, technical sessions in this track cover a wide range of topics on cogeneration/CHP (Combined Heat & power) systems, including but not limited to the following: thermoeconomic analysis, optimization and simulation methods, design, operation & maintenance aspect of Heat Recovery Steam Generators, operation & maintenance issues of cogeneration plants, gas turbine power augmentation technologies (inlet chilling, high pressure fogging, and wet compression or overspray, dry/humid air inject, steam injection, etc.), compressor fouling, inlet air filtration systems, compressor washing, gas turbine upgrades and modifications, environmental and regulatory issues, and lessons learned from field experiences.

Other applications such as non-gas turbine-based cogeneration/ CHP systems (steam turbine and reciprocating engine based systems, solar energy based systems, etc.), cogeneration and cold energy recovery in LNG plants, hybrid cogeneration systems (combined with fuel cells), and organic Rankine cycle based systems are also included.

Panel/Tutorial sessions cover topics on cogeneration technologies, compressor washing technologies, inlet air filtration systems, gas turbine power augmentation technologies, dynamic modeling of cogeneration/CHP systems, gas turbine combustion processes and emissions issues, fuel related issues, and impact of Shale energy market.

- Design and Evaluation Considerations of Waste Heat Recovery Technologies
- Economic Analysis of CHP/Cogeneration Systems
- Techno-Economic Analysis of CHP Systems
- Operational & Maintenance Aspects
- Gas Turbine Power Augmentation Technologies
- HRSG's Design & Operational Issues
- Inlet Air Filtration for Gas Turbines
- Combustion & Emissions
- Gas Turbine Applications Involving Heavy Fuel Oils and Crude Oils
- Dynamic Modeling of CHP Systems
- Condition monitoring and diagnostics for CHP Systems
- Integration of cogeneration systems with energy storage technologies, and Artificial intelligence for energy and economic optimization

Manufacturing Materials & Metallurgy

The field of materials and metallurgy associated with gas turbine manufacturing has traditionally been the source of numerous disruptive technologies such as the development of superalloys, precision single-crystal investment casting and ceramic coatings. These in turn have allowed an incredibly accelerated pace of innovation. Next generation materials and processes will allow even higher efficiency and reliability as well as greater flexibility operational mode. A major goal is to balance these with lower emissions and lower life-cycle cost of turbomachinery. Materials with higher strength, lighter weight and improved durability are required for these applications. The continuing development in metallurgy and materials science has resulted in newer materials, better surface protecting methods, and more reliable component life. Development in manufacturing technologies, including better process planning/optimization, advance machining operations, additive manufacturing, newer coating and repair methods, helps to reduce the manufacturing cost and decrease overall operating cost of gas turbines. Condition assessment of parts after service and advanced repairs are required to further reduce life cycle cost and impact to the environment. The MMM committee is organized to disseminate the latest developments and research results in the areas of manufacturing, materials and metallurgy to gas and steam turbine designers, manufacturers, users, repair and service vendors, researchers and consultants. In addition to technical paper sessions, panel sessions are planned where highly experienced panel members will discuss their latest experiences and knowledge in manufacturing methods, repair/coating processes and component inspections. Tutorials and lectures will be given on gas turbine materials.

- Additive Manufacturing
- Advanced Manufacturing Technologies
- Thermal Barrier Coatings
- Gas Turbine Component Degradation and Life Prediction
- Advances in Gas Turbine Materials
- Advanced Repair Technologies
- Metallurgy for Non-Metallurgists
- Advanced Turbomachinery Manufacturing



Microturbines, Turbochargers & Small Turbomachines

- Microturbines & Small Turbomachines
- Alternate/Opportunity Fuels: Technical issues and economic viability (bio-fuels, landfill gas, etc.)
- Auxiliary systems (such as generators, power electronics and high speed alternators)
- Energy markets and the competitiveness of microturbines vs. reciprocating engines in DG applications
- Heat exchangers (recuperators, regenerators, CHP) design and optimization (CFD, heat transfer, stress analysis) and associated materials and materials degradation
- Intelligent control/engine health monitoring/life evaluation
- Microturbine technologies for long life, fuel efficiency, high power density, wide operability and robust design
- Microturbines systems and concepts for Distributed Power
- Materials for microturbines and small turbomachines: materials issues including durability and high temperature capability (creep, oxidation, fatigue, etc.), and raw material cost (i.e., the need for lower cost materials)
- Microturbine and small turbomachines component design & optimization (compressors, turbines, rotordynamics, bearings, etc.)
- Turbochargers and Superchargers
- Aero, aerothermal, and aeroacoustical analysis of radial, axial, and mixed-flow compressors and turbines (effects of downscaling, heat transfer, map enhancement, surge, choke, etc.)
- Novel charging solutions for downsized and low-emission engines (regulated multi stage charging, turbo compound, electrically assisted charging, variable compressor and turbine geometries, exhaust gas recirculation, etc.)
- Interaction between turbocharger and SI / CI engines (Transient performance, e.g. ball/air/magnetic bearings, TiAl /ceramic turbine wheel, charging concepts, etc.)
- Optimization techniques for multidisciplinary design challenges (e.g. boost pressure vs. efficiency vs. map width vs. transience vs. mechanical constraints vs. packaging vs. etc.)
- Microturbines: Design and Testing of Microturbines
- Microturbines: Innovative Microturbine Design and Uses
- Microturbines: Innovative fuels and uses in microturbines. Recuperator materials
- Turbochargers: Heat transfer & Systems
- Turbochargers: Concepts & Performance
- Turbochargers: Turbines design, testing and modelling
- Turbochargers: Compressors
- Turbochargers & Small Turbomachinery: Bearing systems & NVH

Oil & Gas Applications

The Oil and Gas Industry is a large user of turbomachinery. The demand for oil and gas is consistently growing and changing market conditions require innovative solutions. Operation and optimization of turbomachinery in a variety of Oil & Gas applications is therefore of great interest. Moreover, potentially extreme operation environments require the consideration of innovative design and operational attributes. Sessions in the Oil & Gas Applications Committee address both theoretical and practical Oil & Gas industry perspectives. The technical sessions provide the latest information on gas turbines and compressors in pipeline and compression stations. Particular emphasis is given to design, operation and maintenance, management, dynamic behavior, diagnostics and vibration and noise, as well as to all engineering issues in Oil & Gas applications.

Wet gas compression and multi-phase pumping are also addressed, due to the increasing interest in many installations. The Oil & Gas Applications Committee brings industry experts together in panel and tutorial sessions jointly held by both academic educators and industry professionals. Both basics of Oil & Gas installations and off-design operation issues will be covered, aimed to ensure improved efficiency and safe and reliable operation. The latest information about environmental impact, product upgrade, risk assessment, standards and legislation of gas turbines and compressors in Oil & Gas applications is also provided.

- LNG Liquefaction Plants
- Wet Gas and Multiphase Compression
- Gas Turbine Degradation and Water Washing
- Partical Behavior and Degradation
- Turbomachinery Performance Testing
- Design Details
- Compressor Stations
- Machinery Issues
- Oil and Gas Applications
- Surge Control and System Dynamics
- Hydrodynamic Torque Converters for Oil & Gas Compression and Pumping Applications: Basic Principles, Performance Characteristics and Applications
- Natural Gas Pipelines: Equipment Technology
- Wet Gas Compression
- Compact Compression
- Subsea Compression
- Gas Turbine Upgrades and Uprates
- Turbomachinery Instrumentation Components, Practices, and Uncertainty

Steam Turbine

Turbo Expo 2024 includes a track dedicated to Steam Turbines. While many of the analyses, computational methods, and experimental techniques are common for steam turbines and gas turbines, there are some unique features on steam turbines that warrant special consideration. Separate, co-located, steam turbine sessions at Turbo Expo provide a natural way of sharing many of the cutting-edge technologies while giving the steam turbine community a dedicated forum for the unique technical challenges associated with wet steam, long last stage blades, industrial and co-generation steam turbines, the unique mechanical integrity challenges for steam and more.

Structures and Dynamics: Aerodynamics Excitation & Damping

Authors are invited to present and discuss the following topics:

- Aerodynamic Forcing in Axial Fan and Compressors
- Aeroelastic Stability in Axial Fans and Compressors
- Non-synchronous Vibrations
- Non-Synchronous Vibrations in Fans
- Methods for Aerodynamic Forcing and Damping Prediction
- Aerodynamic Forcing and Damping in Radial Turbomachinery
- Turbine Aerodynamic Forcing and Damping and Seal Aeroelastic Stability

Structures and Dynamics: Bearing & Seal Dynamics

The field of materials and metallurgy associated with gas turbine manufacturing has traditionally been the source of numerous disruptive technologies such as the development of superalloys, precision single-crystal investment casting and ceramic coatings. The type of bearings discussed in this track include but are not limited to gas bearings, tilting pad bearings, fluid film bearings, magnetic bearings as well as squeeze film bearings.

Structures and Dynamics: Emerging Methods in Design & Eng.

Authors and presenters are invited to share and promote efforts and methods in the area of Structures & Dynamics: Emerging Methods in Design & Engineering, also expanding on new design and analysis approaches for additive manufactured technology. Dissemination of knowledge by presenting research results, new developments, and novel concepts in Structures & Dynamics: Emerging Methods in Design & Engineering will serve as the foundation for the conference program on this area. A variety of sessions are available for presentations, as it allows flexibility to the authors.

Structures and Dynamics: Fatigue, Fracture & Life Prediction

Structures & Dynamics: Fatigue, Fracture & Life Prediction Committee creates a forum to discuss theoretical and empirical approaches to determine the lifetime and maintenance requirements of turbo machinery. This includes theoretical prediction approaches for damage mechanisms which govern component lifetime; observations on material or component behavior which relate to component lifetime; experimental methods to generate data to support these topics; empirical approaches based on inspection and evaluation of part condition and damage during service and at end of life. Cyclic, time dependent and pseudo-static damage mechanisms are covered as well as operational history and environments, and material behavior at these conditions. This includes Low and High Cycle Fatigue (LCF & HCF); the combination of cyclic and time dependent mechanisms, Thermo-Mechanical Fatigue (TMF); creep and stress rupture; fracture mechanics and processes relating to fatigue crack initiation and crack growth; any other damage mechanisms which affect component life.

Structures and Dynamics: Probabilistic Methods

Authors are invited to present and discuss various developments in the area of probabilistic analysis, post processing and process modelling.

Structures and Dynamics: Rotordynamics

Main topics of the Rotordynamics Track of the S&D Committee are related to:

- Dynamic Analysis and Stability
- Modeling and Experiments
- Field Balancing and Case Studies
- Active Components and Vibration Control
- Nonlinear Rotordynamics
- Rotordynamics of Micro-machinery
- Rotordynamics of Industrial Fans
- Condition Monitoring and Malfunctions
- Case Studies of Rotating Machinery, and other subjects dealing with dynamic behavior of the rotors

Structures and Dynamics: Structural Mechanics & Vibration

Authors are invited to present and discuss on various developments with regard to structural mechanical and vibrational analysis, prediction and experimental validation.

Student Advisory

The Student Advisory Committee organizes events at Turbo Expo aimed to engage all degree-seeking individuals in the conference. The Student Advisory Committee (SAC) sponsors a Student Poster Competition, Student and Early Career Engineer Mixer and tutorial sessions each year to promote the sharing of technical knowledge and encourage meaningful networking opportunities for students and professionals alike.

Student Poster

The Student Advisory Committee is once again sponsoring a student poster session at ASME Turbo Expo. Student posters will be on display on the main exposition floor.

Supercritical CO₂

Supercritical CO₂ based power cycles provide significant efficiency and cost of electricity benefits to waste heat, thermal solar, nuclear, ship-board propulsion and fossil fuel power generation applications. They also provide for separation, compression, transportation, and storage (geologic) of CO₂ from fossil fuel power plants. The approach to geologic storage of CO₂ benefits greatly from the existing technology and knowledge amassed around CO₂ utilization and management in the oil & gas industry. While the end goals of the CO₂ based power cycles and the CO₂ storage applications are different, the properties of the working fluid, thermodynamics, technology and machinery used for these applications are very similar. The confluence of interests related to the use and management of supercritical CO₂ has created an imperative to further the understanding of these applications. The Supercritical CO₂ Power Cycle committee organizes sessions that focus on the dissemination of machinery and cycle related technologies of sCO₂ power plant applications.

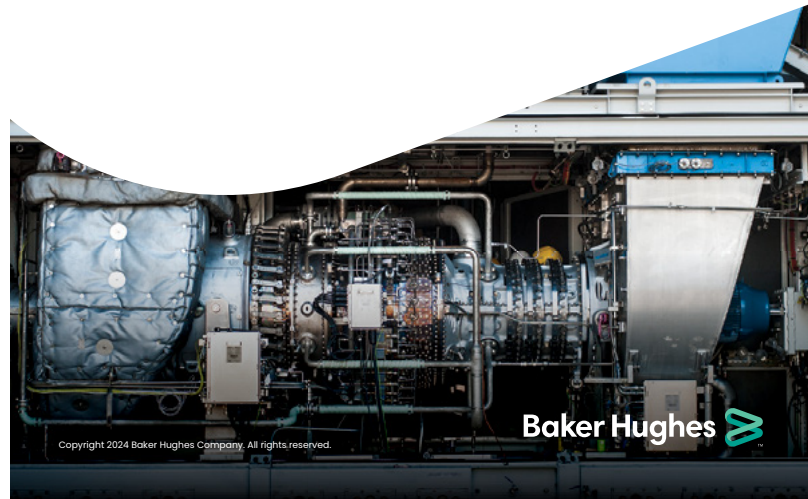
- Fundamentals of sCO₂ Power Cycles
- sCO₂ Heat Exchangers
- Turbomachinery for sCO₂ Cycles
- sCO₂ Cycle Analysis and Optimization
- sCO₂ Combustion and Heat Transfer
- Materials for sCO₂ Cycles
- sCO₂ Cycle Testing
- sCO₂ Cycle Modeling
- sCO₂ Cycle Components

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Turbomachinery: Axial Flow Fan & Compressor Aerodynamics

The field of materials and metallurgy associated with gas turbine manufacturing has traditionally been the source of numerous disruptive technologies such as the development of superalloys, precision single-crystal investment casting and ceramic coatings.

- Compressor Design
- Compressor Experiments
- Transonic Compressor Design
- Fan Design
- Design Concepts
- Test Rig & Facility Design
- Stall & Inlet Distortion
- End-Wall Flows & Passage Contouring
- Water Ingestion, Fogging & Pre-Cooling
- Transition & Roughness Effects
- Manufacturing & Deterioration Effects
- Tip-Clearance Flows
- Seal & Leakage Flows
- Casing Treatment
- Tandem Airfoils
- Flow Control

Turbomachinery: Axial Flow Turbine Aerodynamics

- Aerodynamic Performances and Design
- Aerodynamic Losses
- Aerodynamic Studies
- Unsteady Flows and Transition
- Tip Leakage Flows
- End-wall Profiling
- Low Pressure Turbine Aerodynamics

Turbomachinery: Deposition, Erosion, Fouling, and Icing

- Multi-phase (Water/Ice) Deposition in Gas Turbines
- Modeling Deposition in Turbine Cooling Passages
- Erosion in Turbines
- Deposition Modeling

Turbomachinery: Design Methods & CFD Modeling for Turbomachinery

- Compressor Design Methods & Applications
- Fan Design Methods & Applications
- Turbine Design Methods & Applications
- Radial Turbomachinery Design Methods & Applications
- Cavity, Bearings & Seal Design Methods & Applications
- Methods & Application for Hydrodynamics
- Component Interaction & Multi-Physics Coupling
- Preliminary Design Methods
- LES & DNS Methods & Applications
- Optimization Methods & Applications
- Novel Methods for CFD
- Novel Solver & Simulation Frameworks
- Application & Methods for Unsteady Flow
- Geometry Design & Meshing
- Flow Separation, Loss & Boundary Layer Interaction Methods

Turbomachinery: Ducts, Noise & Component Interactions

- Compressor & Combustion Noise
- Fan & Engine Noise
- Gas Turbine Engine Intakes, Exhaust Diffusers, and Ejectors
- Gas Turbine Engine Transition Ducts and Flow Interactions

Turbomachinery: Multidisciplinary Design Approaches, Optimization, and Uncertainty Quantification

- Parameterization Approaches
- Manufacturing Tolerances and Uncertainties
- Surrogate-Assisted Approaches, including Sampling and Data Mining
- Axial Compressors, Propellers and Fans
- Turbine Design and Cooling
- Preliminary Design Systems and Approaches
- Adjoint Methods
- Multidisciplinary Optimization and Sensitivity Analysis (fluid, structure)
- Sensitivity Analysis and Design for AM

Turbomachinery: Radial Turbomachinery Aerodynamics

- Centrifugal Compressors
- Radial & Mixed Flow Turbines

Turbomachinery: Turbomachinery General Interest

Papers will cover topics of interest to the Turbomachinery Design & Maintenance community which may not be covered by the Turbomachinery primary topic tracks.

Turbomachinery: Tutorials

The tutorials will be of interest for all engineers & researchers concerned with understanding and improving the design process, testing and in-service performance of land and flight-based turbomachinery.

Turbomachinery: Unsteady Flows in Turbomachinery

- Unsteady Flows in Compressors
- Unsteady Flows in Turbines
- Stall & Surge
- Stall & Surge in Centrifugal Compressors
- Unsteady Flows in Centrifugal Compressors
- Analysis & Processing Techniques for Unsteady Flows

Wind Energy

Climate change, the rapid expansion of wind power, and the steady decrease in the cost of wind-generated electricity have made wind power an indispensable part of the global energy mix. Thus, the Wind Energy Technical Program will focus on innovations driving technological advances in the wind industry. The technical presentations cover aerodynamics, aeroelasticity, structures, condition monitoring of wind turbines, the interaction of wind turbines with other energy systems, wind farms, and floating offshore wind turbines. These topics are addressed for small and large machines and vertical and horizontal axis wind turbines. Special panel sessions highlight the industry's challenges, as well as research being undertaken in universities and research laboratories. For experts and beginners, tutorial sessions and workshops will be presented to detail developments and tools employed in the rapidly growing wind industry.

- Measurements and Simulations
- Structures and Aeroelastic Behavior
- Design and Optimization
- Wind Energy Systems
- Modelling of Wind Turbine Flows
- Vertical Axis Wind Turbines
- Operation & Condition Monitoring
- Small Wind Turbines
- Noise
- Blade Aerodynamics
- Reliability and Risk Analysis
- Wind Farms
- Offshore wind turbines

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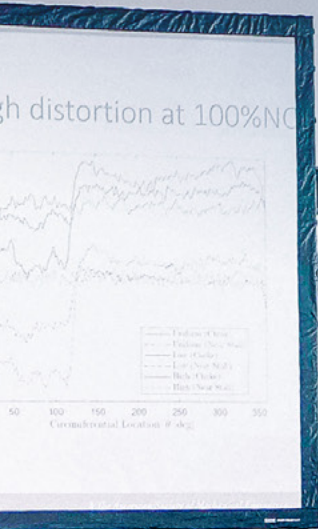
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A male presenter with glasses and a beard, wearing a dark suit, stands at a podium on a stage. He is gesturing with his right hand towards the audience while speaking into a microphone. A laptop is open on the podium in front of him.

Tutorials of Basics

Tutorials of Basics

Track 01: Aircraft Engine

Basics of Gas Turbine Engine Core

Author: Keith Boyer, Practical Aeronautics, Inc.

The Basics of Gas Turbine and Aircraft Engine Performance

Author: Joachim Kurzke, Kurzke-Consulting

Electrified Aircraft Propulsion Approaches for Modeling and Electrical Hardware in the Loop Testing

Author: Joseph Connolly, NASA Glenn Research Center

Basics of Turbohaft Engine Cycle Design and Optimization

Author: Taylan Ercan, Middle East Technical University

Boundary Layer Ingesting Propulsion

Author: David Hall, The Pennsylvania State University

Introduction to Aircraft Engine Cycle Modeling

Author: Robert Clark, Georgia Institute of Technology

Climate Impact of Aviation Emissions and the Implications to Aircraft Engine Design

Author: Feijia Yin, Delft University of Technology

Track 02: Ceramics and Ceramic Composites

Environmental Barrier Coatings for Gas Turbine Applications

Author: Michael Presby, NASA Glenn Research Center

Track 03: Coal, Biomass, Hydrogen & Alternative Fuels

Life Cycle Assessment (Lca) Basics and Application to Optimize the Environmental Sustainability of Gas Turbines

Author: Angela Serra, Baker Hughes

Track 04: Combustion, Fuels & Emissions

Combustion Dynamics Tutorial of Basics

Author: Jacqueline O'Connor, Pennsylvania State University

Combustion Fundamentals

Author: Michael Klassen, Combustion Science & Engineering, Inc.

Adjoint-Accelerated Data Assimilation into CFD and Low Order Models

Author: Matthew Juniper, University of Cambridge

Combustion Dynamics in Gas Turbines – Phenomenon, Monitoring and Control

Author: Thomas Steinbacher, IFTA

Track 05: Controls, Diagnostics & Instrumentation

Optical Diagnostics for Turbomachinery Applications

Author: Tamy Guimarães, The Pennsylvania State University

Gas Turbine Instrumentation for a New Generation

Author: Tamy Guimarães, The Pennsylvania State University

Gas Turbine Gas Path Diagnostics

Author: Yiguang Li, Cranfield University

Track 06: Cycle Innovations

Closed Thermodynamic Cycle Analysis and Optimization

Author: Owen Pryor, Southwest Research Institute

Micro-Gas Turbine: Technological Advancements and Market Research

Author: Antonio Escamilla, University of Seville

Second Law Analysis of Heat Engines

Author: Seyfettin (John) Gulen, Bechtel Infrastructure & Power, Inc.

Energy Storage Cycles at Power Plant Scale

Author: Alberto Traverso, University of Genoa

Step By Step Design of Heat Exchangers for Advanced Thermodynamic Cycles

Author: Christina Salpingidou, Turbo Systems Switzerland LtdE

Track 08: Electric Power

“Numbers to live by” or The Physics Behind the Energy Transition

Author: Alessandro Ramaglia, Industry

Hydrogen Impacts 101: Are You Asking the Right Questions?

Author: Christopher Perullo, Turbine Logic

Track 09: Energy Storage

Overview of Long-Duration Energy Storage Systems and Technologies: Part 1

Author: Natalie Smith, Southwest Research Institute

Overview of Long-Duration Energy Storage Systems and Technologies: Part 2

Author: Natalie Smith, Southwest Research Institute

Compressed Air Energy Storage Systems

Author: David Sánchez, University of Seville

Introduction to ASME PTC53-2022: Performance Test Code for Mechanical and Thermal Energy Storage Systems

Author: William Conlon, Pintail Power LLC

Track 10: Fans and Blowers

Basic Design and Analysis of Axial-Flow Industrial Fans

Author: Massimo Masi, University of Padova

Track 16: Heat Transfer: Tutorials

Optical Diagnostic Techniques Based on Luminescent Paints for Heat Transfer Investigations

Author: Alessio Picchi, University of Florence Department of industrial engineering

CHT and HTC: Some 'New' Perspectives

Author: Li He, University of Oxford

Additive Manufacturing for Gas Turbine Heat Transfer Applications

Author: Stephen Lynch, Penn State University

Track 17: Industrial & Cogeneration

Holistic Heat Pump Design

Author: Clement Joly, SoftInWay, Inc.

Combustion and Emissions

Author: Manfred Klein, MA Klein and Associates

Closed Cycle Gas Turbines for Emissions Free Power Generation

Author: Rakesh Bhargava, Innovative Turbomachinery Technologies

Track 18: Manufacturing Materials & Metallurgy

Binder Jetting of a Superalloy for Compact Gas Turbine Applications:

Design, Manufacturing, and Material Testing Processes

Author: Onome Scott-Emuakpor, Hyphen Innovations

Brazing Fundamentals, Diffusion Brazing and Its Role in Gas Turbine Component Repairs

Author: Warren Miglietti

Gas Turbine Coatings

Author: Dheepa Srinivasan, Pratt & Whitney

Thin Film Deposition Technologies and Characterization Methods

Author: Xiao Huang

Ecological Assessment and Sustainable Productivity for Aircraft Engine Machining

Author: Philipp Ganser, Fraunhofer Institute

Track 19: Microturbines

Best Practices for the Numerical Prediction of Noise Generated by Small Centrifugal Compressors

Author: Roberto Navarro, CMT – Clean Mobility & Thermofluids, Universitat Politècnica de València

Track 20: Oil & Gas Applications

Rotordynamics Theory and Analysis

Author: Jason Wilkes, Southwest Research Institute

H2 Compression Technology Solutions

Author: Lorenzo Cappelli, Baker Hughes

Oil and Gas Applications for Turbomachinery

Author: Rainer Kurz, Solar Turbines

Industrial Gas Turbines

Author: Rainer Kurz, Solar Turbines

Gas Turbines for LNG Production Processes

Author: Manfred Klein, MA Klein and Associates

Track 21: Steam Turbine

An Introduction to Steam Turbines: A Basic Tutorial

Author: Adam Neil, Elliott Group

Track 23: Structures and Dynamics: Bearing & Seal Dynamics

A Review of Active Magnetic Bearing Technology: Past, Present, and Future

Author: Rasish Khatri, Calnetix Technologies

Track 27: Structures and Dynamics: Rotordynamics

Introduction to Rotordynamic Fundamentals

Author: Thomas Kerr, Southwest Research Institute

Know How on Squeeze Film Dampers for Aircraft Engines - Engineering Models & Experimental Verification

Author: Luis San Andrés, Texas A&M University

Track 30: Supercritical CO₂

Materials for Supercritical CO₂ Applications

Author: Henry Saari, Carleton University

Turbo Machinery Design for Supercritical CO₂ Applications

Author: Jeff Moore

Fundamentals of Supercritical CO₂

Author: Jason Wilkes, Southwest Research Institute

Heat Exchangers for Supercritical CO₂ Power Cycle Applications

Author: Michael Marshall, Southwest Research Institute

Track 39: Turbomachinery: Tutorials

Compressible Flow Turbomachinery CFD With OpenFOAM

Author: Jeff Defoe, University of Windsor

Introduction to Large Eddy Simulations

Author: Joseph Mathew, Indian Institute of Science

Reduced Order Modelling Approach for Turbomachinery Secondary Flow System

Author: Clement Joly, SoftInWay, Inc.

Adjoint-based Turbomachinery Shape Optimization: Basic Concepts, Challenges and Applications

Author: Matteo Pini, Delft University of Technology

Track 41: Wind Energy

Challenges in Developing the New Generation of Wind Turbines

Author: Alessandro Bianchini, Università degli Studi di Firenze

Introduction to the Small Wind Turbine Design Using Open-Source Software Qblade

Author: Jesús Alejandro Franco Piña, Escuela Nacional de Estudios Superiores Juriquilla , UNAM Mexico

Solar Turbines

A Caterpillar Company

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(35-39MW)**

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GGT

Exhibition Information

The Exhibition

Turbo Expo 2024 has value added activities to promote traffic to your booth! Daily lunches and afternoon open bars in the exhibit hall are included in the registration package for exhibit booth staff. ASME Turbo Expo is known for its high-quality exhibitions of leading companies in the turbomachinery industry. This is your chance to:



Attract new clients & visit current ones



Learn more about changing needs of the industry



Increase your sales

The 3-day exposition will be held June 25-27 in London, England, UK

Turbo Expo brings together the top players in the turbomachinery industry and academia - attracting a key audience from aerospace, power generation and other prime mover-related industries.

EXHIBITION INFORMATION

Secure your booth now for prime space availability and see how this event can generate bottom-line results for your marketing dollars.

BOOTH SPACE

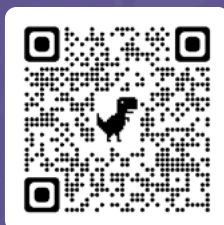
\$3600

+ applicable UK VAT

Each exhibit space is constructed from the modular system.

Booths use aluminum profiles with white infill panels to rear 2.5m walls and 1m high dividing walls, 300mm deep fascia to all open sides.

A standard name board is attached per side detailing company name and stand number.



Advertising

40-Word Company Listing

In the digital Conference Program.

Discounted Advertising Options

in the Advance and Final Programs, along with Mechanical Engineering Magazine and other ASME publications.

Product Category & Company Description

In the online exhibitor directory/ Marketplace with press releases, logo, chat function, videos, meeting setting and brochures.

Opportunity to Present

On the exhibitor stage in the Hall.

Badges and Passes

1 Technical Conference Badge

Per 9sqm of space & access to technical conference papers.

3 Booth Personnel Badges

Per 9sqm of exhibit space.

Complimentary Exhibit Hall Passes

To share with customers and prospects.

Savings

Complimentary Lead Retrieval App

Savings of over \$400.

Discounted Technical Conference Registration

For non-author company employees.

Visit the online floor plan and reserve your booth today.

Contact exhibits@asme.org for more information.



Become a Sponsor

Featuring a variety of sponsorship opportunities designed to maximize your company's visibility, the sponsorship program provides even more ways to stand out from the crowd and make the most of your budget.

ALL SPONSORS RECEIVE



Logo in the official Show Web and Event App



Logo in the Advance and Final Programs



Sponsor ribbons for employees



Recognition in announcements made during the Show



Recognition in the GGTN reaching over 90,000 ASME members



Logo on signage posted during the Show & Show Entrance Unit

Power Package Prices

PLATINUM CLUB

\$20,000.00

Reduced Exhibit Space Rate
by 10%.

5 Complimentary 5-day Technical Conference Badges

Special Discounted Technical Conference Registration Rate
for employees.

Full-Page, 4-Color Ad
in Advance and Final Programs.

Attendee Giveaway
placed in attendee bags, provided by Sponsor.

Special Sign for Booth

Company Provided Banner
prominently displayed during the Show.

Complimentary Exhibit Booth Cleaning
during Show.

Pre-show Email
to registered attendees.

Ad in Conference App

GOLD CLUB

\$15,000.00

Reduced Exhibit Space Rate
by 7%.

4 Complimentary 5-day Technical Conference Badges

Half-Page, 4-Color Ad
in Advance and Final Programs.

Attendee Giveaway
placed in attendee bags.

Special Sign for Booth

Complimentary Exhibit Booth Cleaning
during Show.

Pre-show Email
to registered attendees.

SILVER CLUB

\$10,000.00

Reduced Exhibit Space Rate
by 5%.

3 Complimentary 5-day Technical Conference Badges

Quarter-Page, 4-Color Ad
in Advance and Final Programs.

Special Sign for Booth

Complimentary Exhibit Booth Cleaning
during Show.

Pre-show Email
to registered attendees.

BRONZE CLUB

\$5,000.00

Reduced Exhibit Space Rate
by 2%.

3 Complimentary 5-day Technical Conference Badges

Quarter-Page, 4-Color Ad
in Advance and Final Programs.

Special Sign for Booth

Complimentary Exhibit Booth Cleaning
during Show.

Pre-show Email
to registered attendees.

Additional Sponsorship Opportunities

ATTENDEE BAG INSERT

\$3,000 + Giveaway

Include company literature, promotional items or giveaways in the attendee registration packets.

We will place up to two items in the tote bags for attendees as they register. Include invitations to visit your booth or announcements of product demonstrations or other giveaways.

CONFERENCE AUDIO-VISUAL

\$10,000

Have maximum visibility in over 300 sessions.

Your logo will be posted on the audio-visual screens in the session rooms prior to presentations.

LIMIT 1 SPONSOR

CONFERENCE BAG CHECK

\$3,500

Consider sponsoring the bag check during the Conference.

Every attendee appreciates having a place to stow their luggage at an event. Your company name and logo will be prominently displayed in the bag check area. Opportunity to place flyers at the space.

LIMIT 1 SPONSOR

CONFERENCE COFFEE BREAK

\$5,000

For great conference visibility, sponsor the session coffee breaks.

Select the day of your choice. You may place literature or giveaways on the break stations.

LIMIT 1 SPONSOR

CONFERENCE WIFI

\$15,000

Wi-fi will be available for delegates in the conference area compliments of your company.

This is a valuable opportunity for high visibility to all attendees with a logoed landing page.

LIMIT 1 SPONSOR

DELEGATE LUNCHES

\$10,000

This sponsorship will allow for you to provide brochures and/or giveaways for the attendees on the lunch tables. Logo signage will be provided.

Sponsor can have attendant at the entrance to hand out materials to attendees.

LIMIT 1 SPONSOR DAILY

EXHIBIT HALL RECEPTION

\$3,500

A refreshing way to get the visibility you want!

Signage with your company name and logo will be included on the carts throughout the exhibit hall during the afternoon receptions.

LIMIT 2 SPONSORS

RECHARGE STATION KIOSKS

\$10,000

Allow attendees to power up while visiting the exhibit hall.

Place your literature next to the stations that will have your logo.

LIMIT 1 SPONSOR

STUDENT/EARLY CAREER ENGINEER MIXER

\$5,000

Meet with rising engineers in the turbine industry during this event.

Sponsoring company may provide company literature and a pop-up banner along with the company logo displayed on signage at the event. Perfect for organizations with open staff positions.

WELCOME RECEPTION

\$5,000

Support the Welcome Reception, the largest social event during ASME Turbo Expo.

Opportunity to have a promotional banner at the event.

LIMIT 5 SPONSORS

WATER STATIONS

\$6,500 *(for the week)*

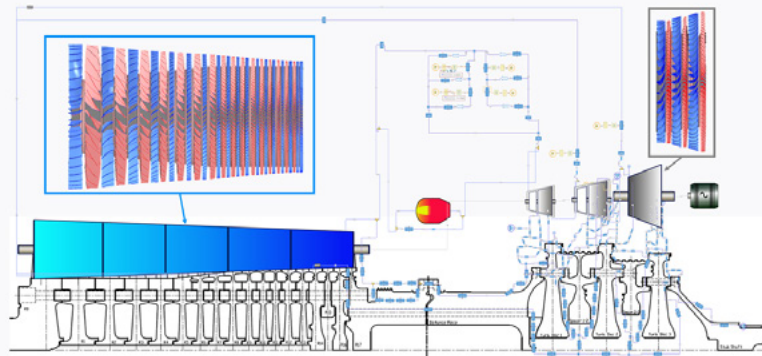
This sponsorship includes your company logo at all Show water stations (exhibit hall, conference area and Keynote).

Showcase your "green" message by providing environmentally friendly cups/bottles to be distributed at Registration with your company name or logo.

LIMIT 1 SPONSOR

Holistic Turbomachinery Design

Seamlessly Iterate Between Components & Systems, Cutting Development Time by 65% with AxSTREAM



See AxSTREAM in Action!
Visit Booth #518



www.SoftInWay.com





Networking Events

Networking Events



EARLY CAREER ENGINEER & STUDENT MIXER

Sunday, June 23

6:00 - 8:00 p.m.

Unwind after a full day of technical sessions and exhibits with fellow engineering students and early career engineers. This popular event allows students to make new friends and build their professional network in a casual evening atmosphere.

CELEBRATING WOMEN IN TURBOMACHINERY EVENT



Wednesday, June 26

7:45 - 10:15 p.m.

Attendees are invited to join colleagues for a networking event that will feature motivating talks. Attendees will have the opportunity to network with women in the industry and learn about the career paths of some successful women in the industry.

EXPO HALL RECEPTIONS

Tuesday & Wednesday, June 25 & 26

5:00 - 6:30 p.m.

All registered delegates are invited to the Exhibit Hall for complimentary drinks and networking with industry colleagues while viewing the exhibits of the industry's leading companies.



WELCOME RECEPTION

Monday, June 24

6:30 - 8:00 p.m.



All Conference registrants are invited to join their colleagues for complimentary light refreshments during the Monday evening event. In a casual atmosphere, greet friends, and meet the thinkers from around the world who are shaping the future of turbomachinery.

DAILY LUNCHES

All Technical Conference delegate badges as well as exhibit booth staff badges include a daily lunch. Additional lunches for guests can be purchased onsite during registration. Take the time during lunch to walk the exhibit floor and visit the many exhibitors from around the world showcasing their products and services.



Registration Information

TURBO EXPO 2024

Registration Details

Turbo Expo will be held in London, England, UK June 25-27, 2024.

FULL CONFERENCE REGISTRATION INCLUDES:



Access to all conference sessions
including technical presentations, keynote sessions, panel discussions, tutorial of basics sessions, and award ceremonies



Admission to networking sessions
including the Welcome Reception, Student/Early Career Engineer Reception & Exhibit Hall receptions



Opportunity to register for the Celebrating Women in Turbomachinery Dinner



Access to the Student Poster Session



Online access to all Turbo Expo 2024 final accepted papers



Admittance into the Turbo Expo exhibition hall



Opportunity to attend facility tours



Access to daily lunches

Conference Registration Pricing

Registration prices are exclusive of VAT 20%. VAT will be applied at checkout.

AUTHOR/PRESENTER REGISTRATION

Registration Category	REGISTER BY April 18, 2024	LATE REGISTRATION May 25, 2024
Author/Presenter	£1,310	All presenters must be registered by April 18, 2024 to submit their final paper.

PARICIPANT ONLY REGISTRATION (ASME MEMBERS)

Registration Category	REGISTER BY May 24, 2024	LATE REGISTRATION May 25, 2024
Member (5 Days)	£1,310	£1,415
Member (3 Days)	£1,125	£1,210
Lifetime (5 days)	£545	£645
Student (5 days)	£545	£645

PARICIPANT ONLY REGISTRATION (NON-ASME MEMBERS)

Registration Category	REGISTER BY May 24, 2024	LATE REGISTRATION May 25, 2024
Non-Member (5 Days)	£1,515	£1,620
Non-Member (3 Days)	£1,310	£1,415
Student Non-Member (5 days)	£570	£670

PARTICIPANT ONLY – GROUPS AND SPONSORS

Registration Category	REGISTER BY May 26, 2024	LATE REGISTRATION May 26, 2024
Group 10+	£1,190	-
Group 31+	£1,125	-
Exhibiting Company Employee	£1,100	£1,150
Platinum Sponsor Employee	£1,050	£1,200



VAT

Why am I paying a VAT on the Congress Registration Fee?

You are paying a Value Added Tax (VAT) on the registration fee because it is required by the UK VAT Act 1994: VAT must be paid on the fees in the country where the congress is held.

Note that the Registration Fees for the virtual participation at the live event are subject to different VAT rules. They can be either subject to French VAT, or subject to the Reverse charge.

Can the VAT be recovered?

Possibly. Only applicants registered for business purposes in a country outside the UK can use the scheme to reclaim VAT paid in the UK.

The applicant does not have to be, or can't be, VAT-registered in the UK and he does not have a place of business or other residence in the UK. Also, he must not make any taxable supplies in the UK for which he is responsible for paying the VAT.

To recover the VAT you must provide a certificate proving your business activity. The certificate must contain

some details (the name, the address of the official stamp of the authorizing body, the nature of your business, your own name and address, your business registration number...) – for all expense invoices and submit all original documentation to your company for its processing.

Note that VAT can't be reclaimed on certain items, like the cost of buying a car, or for goods and services bought for resale, used for business entertainment or used for non-business activities.

What process should companies follow to recover the VAT?

Companies outside the UK must send the VAT refund application directly to the UK Tax Administration (HMRC) at the address below:

HM Revenue and Customs - Compliance Centres
VAT Overseas Repayment Unit S1250
Benton Park View
Newcastle upon Tyne
NE98 1YX
United Kingdom

You must make the claim no later than six months after the end of the 'prescribed year' in which you incurred the VAT. The prescribed year is the twelve months from 1 July to 30 June of the following calendar year, so you must make your application no later than 31 December.

Companies must make their application on [Form VAT 65A](#).

Instructions on how the form must be filled in are available [here](#):

[gov.uk/government/publications/vat-application-for-vat-refund-by-a-business-person-not-established-in-the-community-vat65a](https://www.gov.uk/government/publications/vat-application-for-vat-refund-by-a-business-person-not-established-in-the-community-vat65a)

The application form must be supported by the original version of all invoices included in the claim, as well as an original certificate from the official authority in your own country showing that you are registered for business purposes in that country (you may use [form VAT 66A](#) for the certificate).

There are also minimum VAT amounts that must be met. If the application is for a period covering less than 12 months, the total amount of VAT claimed must not be less than GBP 130. However, when the application is for the full 12 months of the prescribed year, or the period remaining in the prescribed year, the amount of VAT claimed must not be less than GBP 16.



STUDENT REGISTRATION RATES

- Student registration rates are only available to undergraduate and graduate students who are enrolled full-time and have not yet received their Ph.D. Post-docs may not register as students.
- Persons who register at the Student Member or Student Non-Member rate will be required to submit current valid student identification to ASME. If the identification is not validated, the attendee will need to register in one of the non-student registration categories.

GROUP REGISTRATION

Group registration is for groups of 10-30 or 31-50. Please contact igtiprogram@asme.org for assistance with group registration. All group registrations must be paid in full by June 3.

COMPLIMENTARY MEMBERSHIP

Attendees who pay the Non-Member registration rate will be offered a complimentary 4-month ASME trial membership following the conference. ASME will contact eligible registrants and invite them to join ASME within 90 days after the conference. For more information, visit ASME Membership website.

LETTERS OF INVITATION

You will be able to request your Conference Letter of Invitation during the Registration process which will be sent as a PDF attachment via email. **Once your fee is paid in full, your letter will be sent.** If you require a hard copy invitation letter to be mailed to you, you may request and pay for a hard copy invitation letter during the registration process.

BADGE PICK-UP INFORMATION

Badges will not be mailed. All badges must be picked-up onsite. Photo identification is required for badge pick-up at the on-site registration desk. Full Payment is required to attend Turbo Expo. Badges will not be given to anyone with an outstanding payment.

INSURANCE AND LIABILITY

Participation in Turbo Expo 2024 is at your own risk. Please make your own health and travel insurance arrangements.

PROFESSIONAL DEVELOPMENT HOURS (PDH)

A PDH Certificate will be emailed to you after the conference indicating the number of PDHs earned during the conference.

PHOTOS/VIDEOS, AUDIO RECORDINGS

Participants are reminded that material presented at ASME conferences is under the copyright of ASME. As a result, participants are prohibited from recording, screen-capturing, or photographing presentations in their entirety with the intent to distribute them to others.

Student Scholarships

The ASME Foundation and ASME Auxiliary distributed over \$628,000 in scholarships to 148 ME students for the 2023-24 academic year. For academic year 2024-25, the ASME Foundation will have over 40 scholarships available through its universal application, and students can be awarded more than one. Scholarship recipients are selected based on scholastic ability, character, integrity, leadership, and potential contribution to the mechanical engineering profession.

ONLINE APPLICATIONS OPEN **DECEMBER 1**

REQUIREMENTS

Students must be:

- An ASME student member to access the scholarship portal
- A full-time student enrolled at a university in an ABET accredited program; student in their last year of study, graduating can be part-time
- Enrolled at a community college/2-year technical program or in an associate degree program with an emphasis in mechanical engineering, MET or a closely related discipline. Students can be part-time
- And have financial need

More information is available at go.asme.org/scholarships

The International Gas Turbine Institute scholarship of \$2,000 USD is awarded to 20 honorees. Completing the application one time will afford you the opportunity to be considered for all the scholarships – so do not delay and complete the application today! More details can be found at go.asme.org/scholarships.

UNDERGRADUATE

Application Deadline **February 15**
Recommendation Deadline **February 22**

GRADUATE

Application Deadline **February 29**
Recommendation Deadline **March 7**

Leadership Team

2024 Turbo Expo Organizing Committee



Conference Chair
Professor Ricardo Martinez-Botas
Imperial College London



Vice Review Chair
Marc Polanka
Air Force Institute of Technology



Local Liaison Chair
Teng Cao
Imperial College London



Executive Conference Chair
Raul Vazquez
Rolls-Royce



Vice Review Chair
Rudy Dudebout
Honeywell Aerospace



Tutorial Chair
Ioanna Aslanidou
Ma lardalen University



Technical Program Chair
Tom Verstraete
von Karman Institute, Ghent University



Vice Review Chair
Shahrokh Shahpar
Rolls-Royce



Tutorial Outgoing Chair
Stephen Spence
Trinity College Dublin



Review Chair
Andrew Nix
West Virginia University



Local Liaison Chair
Sina Stapelfeldt
Imperial College London



TEOC Representative
Natalie Smith
Southwest Research Institute

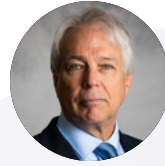
IGTI International Gas Turbine Institute Executive Committee



Chair
Douglas Hofer
Southwest Research
Institute



Member
Vassilios Pachidis
Cranfield University



Treasurer
Richard Dennis
Retired



Past Chair
Akin Keskin
Rolls-Royce



**Organizing
Committee Liaison**
Natalie Smith
Southwest Research
Institute



Member
Karen Thole
The Pennsylvania
State University



Member
Jacqueline O'Connor
The Pennsylvania
State University



Member
Jaroslaw Szwedowicz
Siemens Energy AG



Member
Dimitra Eirini
Diamantidou
Ma larden University

GTTG Gas Turbine Technology Group



Chair
Susan Scofield
Siemens-Energy



Member
Mike Koenig
Siemens-Energy



Member
Peter Stuttaford
Thomassen Energy



Member
Caroline Marchmont
Ansaldo Energia



Member
Dr.-ing. Christian
Steinbach
MAN



Chair, IGTI EC
Doug Hofer
SWRI



Member
Liping Wang
GE



Member
Jim Heidmann
NASA



**Advisor to
GTTG Chair**
Sean Bradshaw
Pratt & Whitney



Member
Sina Stapelfeldt
Imperial College



Member
Richard Sandberg
University of Melbourne



Student News

Student Activities

The Student Advisory Committee (SAC) is a group of students who work to foster student engagement in the IGTI community and improve the Turbo Expo conference every year. Towards this goal, the SAC organizes various sessions and events during the conference, provides opportunities for students to work behind the scenes with leaders in their technical area, and awards travel funds to eligible degree seeking individuals.

SAC COMMITTEE MEMBERS



Chair

Dimitrios Bermperis
*Mälardalen University,
Sweden*



Secretary

Claire-Phonie Bury
*University of Central
Florida, USA*



Vice Chair

Marco Castaldi
*Politecnico di Torino and
Politecnico di Milano, Italy*

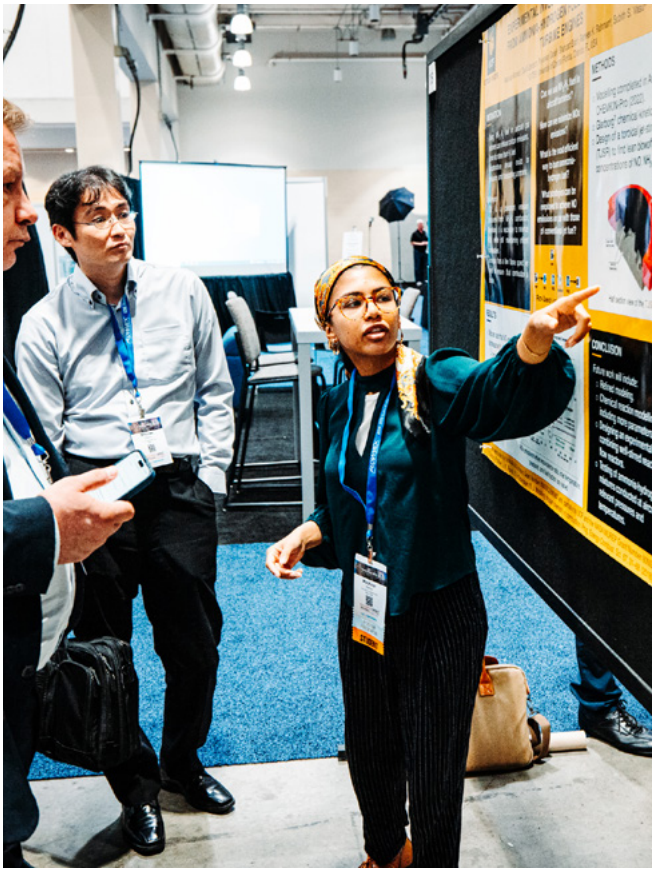


Past-Chair

Dimitra-Eirini Diamantidou
*Mälardalen University,
Sweden*

SAC SESSIONS AT TURBO EXPO

The sessions organized by the SAC during the technical conference are focused on professional development and are open to all conference attendees. In previous years, the SAC has curated panel sessions led by community leaders on Turbomachinery Careers and Networking, as well as tutorial sessions titled “Effective Technical Presentations”, and “The Art of the Peer Review Process”.



POSTER SESSION

The Student Advisory Committee is once again sponsoring a student poster session at ASME Turbo Expo. Student posters will be on display on the main exposition floor on Tuesday, June 27th from 12:30 – 1:30 p.m. Be sure to stop by the poster session to see the results of their work and encourage them to become active in the ASME IGTI community.

CASH PRIZES FOR POSTER SESSION WINNERS



EARLY CAREER ENGINEER & STUDENT MIXER

ExCel Convention Center
Sunday, June 23, 6:00 P.M. – 8:00 P.M.

Kick off your week at Turbo Expo by connecting with fellow engineering students and early career engineers. This popular event allows students to make new friends and build their professional network in a casual evening atmosphere. Complimentary refreshments will be provided.



2023 Industry Participants

ASME Turbo Expo is proud to have Industry participants from all over the world. These individuals are active within the technical conference and participate as authors, panelists, reviewers, session organizers, session chairs, etc.

