Turbo Expo 2023

Final Program

JUNE 26-30, 2023

BOSTON, MASSACHUSETTS

The American Society of Mechanical Engineers® (ASME®)

Photo: Kyle Klein

Pioneering innovation for sustainable flight

The Rolls-Royce Trent engine family is already making a substantial contribution to sustainable aviation by maximising efficiency on every single flight.

All Trent engines can be operated on blended fuel with up to 50% Sustainable Aviation Fuel (SAF) content, enabling lower carbon flying. By the end of 2023, all Trent engines will be compatible with 100% SAF.

#FlyNetZero #PowerOfTrent

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Welcome to Turbo Expo 2023!

With the climate grand challenge before us, the landscape for how humankind and technology interact with the environment is undergoing a critical transition. Someone once questioned my choice of research because they perceived the gas turbine was a dying research area, but as I look upon the energy transition task ahead of us, I most clearly see how wrong they were. Whether it be aviation, power, or an adjacent field, we engineers have the great fortune to be an active participant in this pivotal time for gas turbine technology. We are working in a truly exciting time. As the premier venue for gas turbine technology research, the pathway to sustainable, reliable, and affordable solutions is embedded in the over 1000 technical papers, 50 tutorials, and 30 panel discussions to be presented this week at the 2023 Turbo Expo.

The Monday Keynote will feature industry leaders from a variety of professional backgrounds who will outline the climate grand challenge and highlight future solutions from multiple perspectives. In Tuesday's plenary "Gas Turbines for a Sustainable Future," leading executives of several gas turbine manufacturers will discuss their company's efforts and envisioned technologies to achieve sustainability goals. Then Wednesday's plenary "Workforce Development and Diversity: The Engineer of the Future" will discuss how the industry must navigate workforce development in a dynamic labor market while also tackling the diversity, equity, and inclusion of that workforce. During a parallel panel on Wednesday afternoon, representatives from US and European government agencies will give their perspective and discuss goals of their funding opportunities and cross-cutting efforts.

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

To make this week successful an incredible effort from ASME staff and countless volunteers is required. On behalf of the ASME Turbo Expo Organizing Committee, we wish to thank our sponsors who have so generously contributed to success of this event. Also, we wish to acknowledge the dedicated service of our Executive Conference Chair Zolti Spakovszky; Technical Program Chair Dale Van Zante; the Review Chair Tom Verstraere; the Vice Review Chairs Virginie Chenaux, Andrew Nix, and Marc Polanka; Tutorial Chair Stephen Spence; Representative to the IGTI Executive Committee Jaroslaw Szwedowicz; and our Local Liaison Committee Chair Sara Campbell. Special thanks to the keynote and plenary moderators and panelists who volunteered their time and contributed to the discussion of the climate challenge. Turbo Expo would not be the world's premier gas turbine technology event without the dedicated time and effort given by the authors, reviewers, session chairs, committee leaders, and ASME staff. Thank you.

I hope you find this week's conference to be filled with quality content and meaningful interactions. Thank you for joining us!

Natalie R. Smith
Conference Chair
Group Leader - R&D
Southwest Research Institute

Welcome to "Beantown"

THE BIRTH-AREA OF THE US JET ENGINE AND A PLACE DRIVING SUSTAINABILITY

It is our pleasure to welcome you to the City of Boston, the capital of the Commonwealth of Massachusetts, the cultural and financial center of the New England region, a hub for science and research, and a world leader in higher education, innovation, and entrepreneurship. The greater Boston area is home to over 70 colleges and universities, among them Harvard and MIT, which are within a few miles of the conference site (sign up for a guided campus tour).

Founded in 1630 and nicknamed "Beantown" after the baked beans that date back to the state's Native American roots, Boston is one of the oldest cities in the United States. It witnessed a number of historic events of the American Revolution and the founding of America. A walk through Boston's historic district reveals cobblestone pathways and classic architectures giving a European feel (take a stroll along the Freedom Trail). The harbor served as a major trading port and is still a main gateway to Europe. Boston is a melting pot and home to many different cultures, languages, and cuisines (enjoy a large variety of international restaurants – if you want to stay local, make sure to taste a cup of clam "chowda" or have a New England "lobsta").

The city and its neighborhoods are home to many celebrities, luminaries, and political figures. For example, John F. Kennedy was born close by in Brookline and started his political career representing a working-class Boston district in the U.S. House of Representatives (visit the JFK Library in Dorchester). Martin Luther King Jr. came to Boston searching for a multicultural community and a setting for his study of ethics and philosophy, earning his Ph.D. at Boston University and living in the South End neighborhood adjacent to the Convention Center. During the Second World War, Sir Frank Whittle secretly arrived in Boston Harbor and was brought to General Electric in Lynn just north of the city to help develop the first US gas turbine jet engine (visit GE on a guided tour). With the help of US industry, the MIT GasTurbine Laboratory was established in 1947 to serve as the first US laboratory for propulsion research.

Boston businesses and institutions rank among the top in the country for environmental sustainability and new investment, and make the city the perfect host for the 2023 Turbo Expo Technical Conference and Exposition themed "Collaborate, innovate and empower – propulsion & power for a sustainable future". On Monday morning our keynote speakers will lay out the climate grand challenge and highlight future energy solutions and pathways which strive to balance sustainability, reliability, and affordability. On Tuesday, and in response to the Monday keynote, industry leaders will share their perspectives, company efforts, and proposed technologies to achieve the sustainability goals. On Wednesday, a plenary panel on workforce development will discuss "the Engineer of the Future" in the context of the climate grand challenge. In parallel, a plenary panel on federal funding will lay out government plans on supporting the required efforts and multi-disciplinary collaborations cutting across organizations, sectors, and disciplines.

I can't wait to personally welcome you to Turbo Expo 2023, to an exciting and productive conference, and to a most enjoyable stay in Beantown.

Zolti Spakovszky
Executive Conference Chair
T. A. Wilson Professor of
Aeronautics & Astronautics
Massachusetts Institute of Technology

BOSTON, MASSACHUSETTS

Boston: America's Walking City

Summer is a great time to explore Boston. Affectionately known as "America's Walking City," you can stroll the city's sidewalks, wander its abundance of green parks, or just people-watch at one of the many outdoor cafés.

Discover Boston's vibrant culture while strolling historic streets through diverse neighborhoods. The unique personality of each neighborhood can be found in the cuisine of the restaurants and in the style of the shops, galleries, and open markets and above all, in its people.

BOSTON SUMMER HAPPENINGS

- Summer Festivals
- Food, Wine & Craft Beer Events
- Performing Arts: Theater & Concerts
- Sports & Recreation
- Visitor Center & Digital Guidebooks
- Labor Day Weekend Guide
- Explore Boston Neighborhoods
- Beyond Boston
- Great Deals & Free Things to Do

GETTING AROUND BOSTON

It may be “America’s Walking City,” but Boston also features an extensive transportation system to help you navigate smoothly, from Harvard to the Harbor.

Boston’s public transportation system is operated by the Massachusetts Bay Transportation Authority (MBTA), but locals know it simply as the “T”. It offers subway, bus, trolley car and boat service to just about everywhere in the Greater Boston area and beyond. Subway stops are color coded - Red Line, Green Line, Blue Line, Orange Line or Silver Line.

Other options include the Commuter Rail, taxi, bus, and bicycles.

TIPPING

- **Taxi drivers, bartenders and waiters:** 15-20% for standard service
- **Hotel doormen and valet parkers:** between $2 and $5
- **Bellhops:** $2 per bag
- **Chambermaids:** $2 per day which can be left on the pillow of your hotel room

CURRENCY

International travelers can exchange currency at several booths in Logan Airport upon arrival and:

Boston Currency Exchange
International Copley Place, Second Floor
100 Huntington Avenue; 170 Federal Street

Travelex Currency Exchange
745 Boylston Street

Currency exchange is also available at local banks.

FOOD & DRINK

Boston’s ever-evolving food and drink scene makes dining out the perfect way to experience the cultural fabric of our great city. From hot pot, dumplings and noodles in the nation’s third-largest Chinatown to soul-warming Italian plates in the North End, Boston’s restaurant scene truly brings something to the table for everyone.

ELECTRICAL OUTLET

In the United States of America the power plugs and sockets are of type A and B. The standard voltage is 120V and the standard frequency is 60 Hz.

WEATHER

Summer can be delightful with the ocean breezes helping keep the humid temps in control. Evening temperatures can be cool and may require a light sweater. And a pop-up thunderstorm is not uncommon, so you may want to include an umbrella in your bag. Summers average high temperatures in July are above 80 °F (26.7 °C) and overnight lows above 60 °F (15.5 °C).

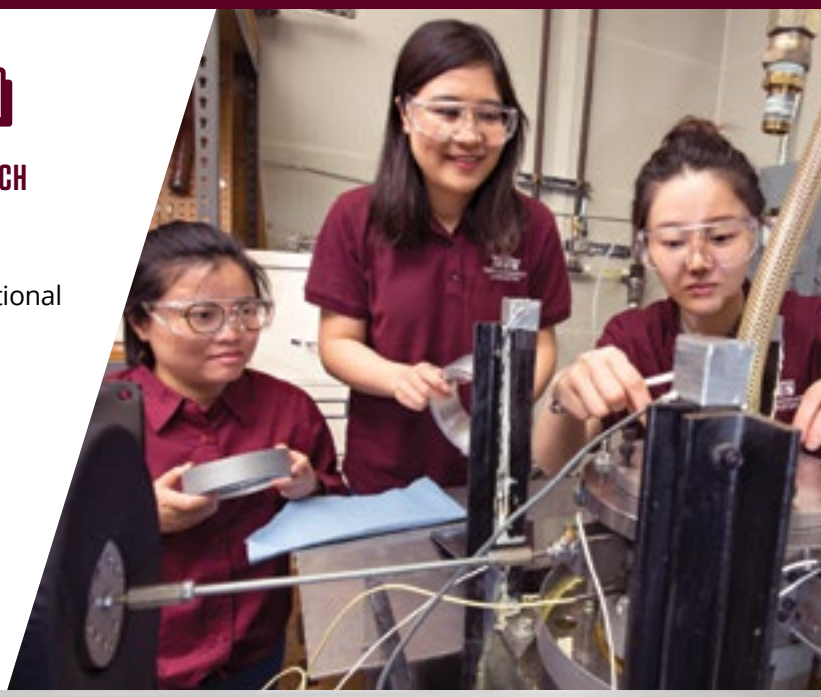
HYNES PARKING

Within a three-block walk of the Hynes Convention Center are numerous parking garages totaling over 4,400 spaces. There is limited meter parking available around the Hynes and adjacent streets.

BRINGING **EDUCATION** AND **INDUSTRY** TOGETHER.

EDUCATION **WORKFORCE DEVELOPMENT** **RESEARCH**

The Turbomachinery Laboratory at Texas A&M conducts a variety of fundamental and applied research through traditional grants and the Turbomachinery Lab Research Consortia.



RESEARCH AREAS

Rotordynamics & Mechanical Systems • Thermal Fluids & Combustion • Computational Modeling & Design

TEXAS A&M UNIVERSITY | TEES TURBOMACHINERY LABORATORY | TRC 1981 | EPRC 2023

GET INVOLVED! SUBSCRIBE TO OUR MAILING LIST:

turbolab.tamu.edu | tps.tamu.edu | atps.tamu.edu

LOCAL LIAISON COMMITTEE

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GE Aerospace

Kate Guerrina
Concepts NREC

Valentine Morozi
SoftInWay

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Concepts NREC

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GE Aerospace

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Be sure to visit their booths during the event.

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Early Career Engineer & Student Mixer

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Early Career Engineer & Student Mixer

PIEZOCRYST
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Attendee Bag Inserts

MEDIA PARTNERS

COMPRESSOR TECH²
DEDICATED TO GAS COMPRESSION PRODUCTS AND APPLICATIONS

GAS COMPRESSION magazine

Linquip

Diesel & Gas Turbine WORLDWIDE
COVERING LARGE ENGINE AND GAS TURBINE MARKETS SINCE 1969

ETN Global

esg REVIEW
A JOURNAL OF RECORD FOR ENVIRONMENTAL, SOCIAL, AND GOVERNANCE DEVELOPMENTS

MPS modern power systems

Gas Turbine World

SUPPORTING ORGANIZATIONS

GTSJ

TEES TURBOMACHINERY LABORATORY
TEXAS A&M ENGINEERING EXPERIMENT STATION

Pathways to Net-Zero Carbon Emission

Accelerating Electrification—Hybrid Electric and Gas Turbine Propulsion

MONDAY, JUNE 26, 2023 / 10:30 AM – 12:00 PM / THIRD FLOOR, BALLROOM A, B & C

What leaps in innovation and technology are required to meet the net-zero goal by 2050?

In this keynote session, industry leaders will examine solutions and pathways forward that strive to balance sustainability, reliability, and affordability. The conversation will be driven by speakers from a variety of professional backgrounds who bring multiple perspectives to this complex challenge. Mark Cousin, Chief Technology Officer of Universal Hydrogen, is a leading aviation pioneer, having served as CTO of both Airbus and United Technologies Corp., leading both companies aggressively toward electrification. Flavio Leo, Director, Aviation Planning and Strategy for the Massachusetts Port Authority, is responsible for near- and long-term aviation planning and policy development related to airport physical planning, airfield and airspace safety, and efficiency initiatives. And Anne E. White, Department Head of the Nuclear Science and Engineering Department at MIT, currently co-chairs the MIT Climate Nucleus, charged with managing and implementing MIT's new climate action plan. Additional participants will be announced soon.

SPEAKERS

Mark Cousin
Chief Technology Officer
Universal Hydrogen

Anne E. White
Department Head of the Nuclear Science and Engineering Department
MIT

Flavio Leo
Director, Aviation Planning and Strategy
Massachusetts Port Authority

MODERATORS

Zolti Spakovszky
T. A. Wilson Professor in Aeronautics and Astronautics
Head, Air Sector
Director, Gas Turbine Laboratory
MIT Gas Turbine Laboratory

Dr. Natalie Smith
Group Leader: Research and Development
Southwest Research Institute

TUESDAY PLENARY

Gas Turbines for a Sustainable Future

TUESDAY, JUNE 27 / 10:30 AM – 12:00 PM

How will the gas turbine industry respond to the challenge of net-zero goals? This panel will feature executives of gas turbine manufacturers. Given the challenges and opportunities of sustainable aviation and power generation, they will discuss their company's efforts and envisioned technologies to achieve sustainability goals.

MODERATORS

Nicole Key
Associate Head for Graduate Studies
Purdue University

Karen Thole
Distinguished Professor
The Pennsylvania State University

SPEAKERS

Geoff Hunt
Senior Vice President, Engineering
Pratt & Whitney

Arjan Hegeman
General Manager, Advanced Technology
GE Aerospace

Dr. Kathleen O'Brien
Vice President, Technology & Innovation
Siemens Energy

Steve Wellborn
Head of Design System Engineer
Rolls-Royce

WEDNESDAY PLENARY

Workforce Development and Diversity: The Engineer of the Future

WEDNESDAY, JUNE 28 / 10:30 AM – 12:00 PM

Amid this technology push to meet the 2050 sustainability goals, how must the industry navigate workforce development in a dynamic labor market while also tackling the diversity, equity, and inclusion of that workforce? In this plenary panel, speakers will discuss the Engineer of the Future in light of this challenge.

MODERATORS

Dimitra-Eirini Diamantidou
Ph.D. Candidate
Mälardalen University

Sean Bradshaw
Chair, ASME Gas Turbine Technology Group "Senior Fellow, Sustainable Propulsion"
Pratt & Whitney

SPEAKERS

Santosh Hemchandra
Associate Professor
Indian Institute of Science

Jacqueline O'Connor, Ph.D.
Professor of Mechanical Engineering
Director, Center for Gas Turbine Research, Education, and Outreach
The Pennsylvania State University

Susan Scofield
Vice President of Business Operations
Siemens Energy

Joe Allen
GM, Business Systems Operations
GE Aerospace

TURBO EXPO 2023

Award Recipients

Congratulations to all award recipients and thank you to all ASME IGTI committee award representatives whose work assists the awards and honors chair and the awards committee in the recognition of important gas turbine technological achievements. Thank you to William T. Cousins for serving as the IGTI Honors and Awards Committee Chair, John Gülen as Industrial Gas Turbine Technology Award Committee Chair, and Konstantinos Kyprianidis as the Aircraft Engine Technology Award Committee Chair.

2023 ASME R. Tom Sawyer Award

Awarded to...

Dr. Karen A. Thole

2021 ASME Gas Turbine Award

Awarded to...

Jinwook Lee
Zoltán S. Spakovszky
Mark Drela
Edward M. Greitzer
Jérôme Talbotec

2021 John P. Davis Award

Awarded to...

Dale Tree
Dustin Badger
Darrel Zeltner
Mohsen Rezasoltani

2023 ASME Dedicated Service Award

Awarded to...

Ricardo Martinez-Botas
Natalie R. Smith

2023 IGTI Scholar Award

Awarded to...

Dr. Rakesh K. Bhargava

2023 Aircraft Engine Technology Award

Awarded to...

Anestis Kalfas

2023 Industrial Gas Turbine Technology Award

Awarded to...

Vittorio Michelassi

2023 Dilip R. Ballal Early Career Award

Awarded to...

Raghu Kancherla

For more details on award winners, please refer to the **2023 Awards Program** available on our website.

Upcoming Award Opportunities

2024 ASME R. Tom Sawyer Award

NOMINATE TODAY →

by August 15, 2023

2024 Dilip R. Ballal Early Career Award

NOMINATE TODAY →

by August 1, 2023

2024 Aircraft Engine Technology Award

NOMINATE TODAY →

by October 15, 2023

2024 Industrial Gas Turbine Technology Award

NOMINATE TODAY →

by October 15, 2023

For more information on how to submit a nomination for an award, visit asme.org/about-asme/honors-awards/honors-policy/how-to-nominate

IGTC
International
Gas Turbine Conference

ETN Global

ETN's 11th International Gas Turbine Conference

10-11 October 2023 | Brussels | Belgium

Dispatchable technology & innovations for a carbon-neutral society

IGTC is a biennial conference organised by ETN offering:

- keynote sessions with executives & policy makers addressing the energy transition
- presentations on energy market outlook & technology needs in key markets globally
- technical papers with latest R&D activities & technology achievements

To register scan the QR code:

Award Lectures

SCHOLAR LECTURE

Evolution of Gas Turbine Technologies for Air, Land and Sea: 80+ Years of Historical Overview

MONDAY, JUNE 26 / 5:45 PM – 7:00 PM / BALLROOM: A,B,C

Rakesh K. Bhargava, Ph. D.

ASME Fellow Founder & President, Innovative Turbomachinery Technologies

Gas turbine technology is one of the major innovations of the 20th Century which has provided society the fastest mode of transportation and one of the cleanest and most thermally efficient means of producing electrical, mechanical and propulsive power. The development of gas turbines has a long yet phenomenal history of technological achievements and the gas turbine is a unique ever-evolving technology due to multitude of parameters affecting its performance as it will become evident in this presentation.

Gas turbines have been used in numerous applications, including but not limited to, aviation, power generation, marine, oil & gas industry, chemical plants, energy storage, railway locomotives, battle tank, high speed boats, naval ships, cruise missiles, drones, space program, and others. It is the only power generating machine having capability to operate with wide variety of fuels.

This presentation discusses the progress attained over more than 80 years in the development of gas turbine technologies from the perspective of aviation, industrial, and marine applications.

The development of gas turbines is illustrated chronologically by examining the progress made in the component's design, aerodynamic and heat transfer features, combustion, fuel and associated emissions aspects, hot-gas-path components cooling methods, materials, metallurgy, manufacturing, and coatings technologies and other relevant aspects to achieve the current levels of performance advancements. The gas turbine market evolution in conjunction with the technology growth including expected market in the next decade combined with the future prospects of gas turbines in relation to renewable energy mix and use of hydrogen fuel for addressing global warming concern are also included.

IGTI INDUSTRIAL GAS TURBINE TECHNOLOGY AWARD

High-Fidelity and Machine-Learning Methods for Turbomachinery in the Age of Energy Transition

MONDAY, JUNE 26 / 1:30 PM – 3:30 PM / ROOM 109

Vittorio Michelassi, PhD

Large-scale conversion of energy into electricity, mechanical power, or propulsion, will require turbomachines for many years to come. Turbomachines—gas turbine engines in particular—are undergoing significant changes due to new demanding requirements dictated by environmental concerns, cost, operability, and availability.

Consequently, the ever-growing demand for improved efficiency, availability, footprint and cost reduction, does challenge design methods the accuracy of which requires a constant upgrade to keep the pace with new type of fluids, materials, fuels, and manufacturing technologies. The application and development of gas-turbine technology is heavily influenced, and limited, by the quality and capability of the conventional design methods and tools the accuracy of which must be improved, as design uncertainties translate into design margins and ultimately sub-optimal performance.

Moreover, in the foreseeable future there will be further step-changes in technology and opportunities the adoption of which will require reducing risks associated with designing in unchartered design spaces, or operating machines in unchartered conditions. In the last decade new design verification methods emerged. Such methods offer unprecedented accuracy and use machine learning approaches to take advantage of the availability of massive high-fidelity datasets, intractable with conventional engineering approaches. The absolute accuracy offered by new digital models will allow shorter time cycle for design-to-market without compromising performance, availability, and cost.

IGTI AIRCRAFT ENGINE TECHNOLOGY AWARD

Accelerating Electrification – Hybrid Electric and Gas Turbine Propulsion

TUESDAY, JUNE 27 1:30 PM – 3:30 PM / ROOM 109

Prof. Anestis I. Kalfas

Hybrid electric propulsion has the potential to bring disruptive gains in overall aircraft energy efficiency related emissions. Furthermore, alternative energy carriers such as batteries and H_2 have their own limitations before they are adopted as new means of powering aviation. This lecture covers recent Research Innovation activities on the hybridisation on commuter aircraft to:

- Identify merits of hybridisation in regional air mobility and explore the future of Gas Turbine propulsion in the foreseeable future
- Identify the scientific and technical challenges of deploying new propulsive architectures
- Exploit the knowledge gained to upscale technologies in larger aircraft
- Develop and integrate the conceptual design of a near zero emission commuter aircraft, based on hybrid electric propulsion configurations

Leadership Team

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Southwest Research Institute

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Vice Review Chair
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Advisor
Zolti Spakovszky
MIT Gas Turbine Laboratory

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Vassilios Pachidis
Cranfield University

Member
Jacqueline O'Connor
The Pennsylvania State University

Member
Douglas Hofer
Southwest Research Institute

Networking Events

Early Career Engineer & Student Networking Mixer

SUNDAY, JUNE 25, 7:30 – 9:30 P.M.
HYNES CONVENTION CENTER, ROOM 304

Looking to kickstart your networking for the conference week ahead? ASME IGTI and the SAC will host a fast-paced networking and social event to help students expand their network and connect them with experienced professionals from around the world.

Students will have the opportunity to participate in up to 3 roundtable discussions with distinguished Turbo Expo Technical Committee Chairs. They will be able to answer questions, foster new relationships, and learn how to develop long-term connections with IGTI. In addition, students can enjoy complimentary refreshments and mingle with their peers in a relaxed atmosphere.

Networking Lunches

MONDAY – THURSDAY

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

Welcome Reception and ASME/IGTI Awards NEW

MONDAY, JUNE 26, 7:00 – 8:30 P.M.
BOSTON SHERATON, BACK BAY
BALLROOM, 2ND FLOOR

All Conference registrants are invited for complimentary light refreshments during the Monday evening event. Join colleagues to celebrate IGTI award winners and meet thinkers from around the world who are shaping the future of turbomachinery. The prestigious IGTI awards that will be announced at the Welcome Reception include:

- R. Tom Sawyer Award
- Gas Turbine Award
- Dedicated Service Award
- Aircraft Engine Technology Award
- Industrial Gas Turbine Technology Award
- John P. Davis Award
- Dilip R. Ballal Early Career Engineer Award
- Scholar Award

Expo Hall Networking Receptions

TUESDAY & WEDNESDAY, JUNE 27 & 28
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.

Celebrating Women in Turbomachinery Dinner

$15 REGISTRATION FEE
WEDNESDAY, JUNE 28 | 7:45 – 10:00 P.M.
LENOX HOTEL, 61 EXETER ST,
BOSTON, MA 02116, 2ND FLOOR

Cadence, GE, and Pratt & Whitney are proud to support the Celebrating Women in Turbomachinery Dinner at this year's ASME Turbo Expo. The evening provides an opportunity to have discussions on career strategies, work/life balance issues, and professional leadership approaches for women in engineering. These strategies and more will be the topic of dinner speakers who will provide their work and life experiences. We hope you will join us!

SPEAKERS

Sara Campbell
Executive- Rotorcraft Heavylift Engineering
GE Aerospace

Jill M. Albertelli
President, Military Engines
Pratt & Whitney

Carolyn Woeber
Applications Engineering Director
Cadence

Turbo Expo 2024

LONDON, ENGLAND, UK • ExCeL CONVENTION CENTER

SAVE THE DATE | **June 24 – 28, 2024**

Whether you're looking for your next R&D partner or employer, discovering new research ideas, or building your company's brand, ASME Turbo Expo is where the turbomachinery community gathers. Join 2,000+ professionals from around the globe to advance your career and advance the industry.

THE 2022 PROGRAM INCLUDED:

- 2,000+ Attendees
- 1,000+ Technical Presentations, Tutorials and Panels
- 90+ Exhibitors
- Endless Networking Opportunities

2024

Publication Schedule

2023

October 27

Abstract Submittal Deadline

2023

November 24

Notification of Abstract Acceptance

2024

January 5

Submission of Full-Length Paper for Review

2024

February 9

Paper Review Complete

2024

February 16

Paper Acceptance Notification

2024

March 18

Author Notification of Acceptance of Revised Papers

2024

March 1

Submission of Revised Paper for Review (If Required)

2024

April 15

Submission of Copyright Form

2024

April 18

Final Paper Submission

2024

April 25

Final Paper Decision Notification

ASME TURBO EXPO 2023

Student News

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
Dimitra Eirini Diamantidou
Mälardalen University, Sweden

Vice Chair
Mohammed Ibrahim Kittur
University of Malaya, Kuala Lumpur

Secretary
Dimitrios Bermperis
Mälardalen University, Sweden

Past-Chair
Mavroudis Kavvalos
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”.

Early Career Engineer & Student Networking Mixer

SUNDAY, JUNE 25, 7:30 – 9:30 P.M.
HYNES CONVENTION CENTER, ROOM 304

Looking to kickstart your networking for the conference week ahead? Join the ASME IGTI and SAC's fast-paced networking and student mixer event to connect with experienced professionals from around the world and expand your professional network.

At the event, students can participate in up to three roundtable discussions with distinguished ASME IGTI Technical Committee Chairs, where they can ask questions, build relationships, and learn how to develop long-term connections with IGTI. In addition, students can enjoy complimentary refreshments and mingle with their peers in a relaxed atmosphere.

Empowering the Next Generation: A Student-Focused Panel Discussion on Sustainable Turbomachinery

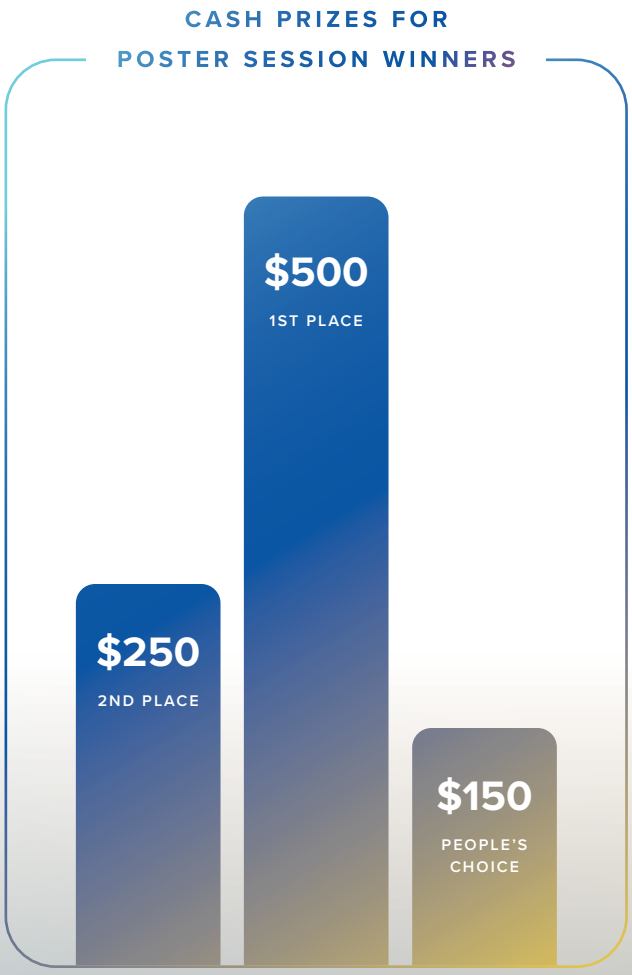
WEDNESDAY, JUNE 28, 4:00 – 5:30 P.M.
BALLROOM A, B, C

A student-focused panel session organized by the SAC and the Gas Turbine Technology Group (GTTG) will take place during ASME Turbo Expo 2023. Four panelists will be invited to discuss challenges, trends and key elements around sustainability. Special focus will be given to how students can contribute to the journey of becoming more sustainable and industry goals.

Poster Sessions

TUESDAY, JUNE 27, 12:00 – 1:30 P.M.
MAIN EXPOSITION FLOOR

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 12:00 – 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. Poster Award Winners, including People's Choice, will be announced at Thursday's Closing Ceremony.



The Student Advisory Committee and Early Career Engineer Travel Awards help to cover travel costs for young engineers to attend ASME Turbo Expo. Both travel awards will be recognized at the Closing Ceremony, taking place at 1:00 pm on Thursday, June 29, in the Exhibition Hall.

2023 STUDENT ADVISORY COMMITTEE TRAVEL AWARD WINNERS

Achinie Nataliya Warusevitane
University of Nottingham

Akchhay Kumar
Indian Institute of Technology Kharagpur

Anand P. Darji
Sardar Vallabhbhai National Institute of Technology

Andrea Notaristefano
Politecnico di Milano

Antonino Federico Maria Torre
von Karman Institute for Fluid Dynamics

Deepanshu Singh
University of Oxford

Evan Lundburg
Pennsylvania State University

Gustavo Lopes
The University of Liège

Konstantinos I. Papadopoulos
Aristotle University of Thessaloniki

Mizuki Okada
von Karman Institute for Fluid Dynamics

Noraiz Mushtaq
Politecnico di Milano, Italy

Pratikshya Mohanty
The Pennsylvania State University

Ryan Wardell
University of Central Florida

Sean K Hanrahan
The University of Melbourne

Sergio Grasa Martinez
Purdue University

Taha Sherif Mohamed Namany Sherif
Menoufia University

Troy Krizak
The Ohio State University

Umang H. Rathod
Indian Institute of Technology Guwahati

Vamsi Krishna Undavalli
The University of Albama

Zhenhao Jing
Georgia Institute of Technology

2023 TURBO EXPO EARLY CAREER ENGINEER TRAVEL AWARD WINNERS

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

Yu Xia
Ansys UK Ltd.

#TurboExpo

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linkedin.com/company/asme-international-gas-turbine-institute

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NO PASSWORD REQUIRED

Student Poster Presenters

HYNES EXHIBIT HALL / TUESDAY, JUNE 27, 2023 / 12:00 PM – 1:30 PM

Be sure to vote for the People's Choice Student Poster. Voting kiosks are located at the entrance of the Expo hall and near the student posters. Student Poster winners will be announced at the Closing Ceremony taking place Thursday, June 29, at 1:00 pm in the Exhibit Hall.

Adrien Misandeau, *École de Technologie Supérieure (ÉTS) de Montréal*

GT-2023, 102675: Effect of Modern Nozzle Technologies on the Near-Field Contrail Properties Behind an Aircraft Engine Using a Cfd-Microphysics Coupling.

Akchhay Kumar, *IIT Kharagpur*

GT-2023, 110336: Innovative Lightweight Compression System Based on Axial-Centrifugal Contra-Rotating Concept

Andrew Cusator, *Purdue University*

GT-2023, 110246: A New Research Facility for the Development of Fan Casing Treatments

Benedikt Schulten, *Technische Universität Braunschweig*

GT-2023, 109897: Application of the Ifas Research Turbofan Engine V2500-A1 in Three Projects Across Mro and Engine Performance

Benjamin Francolini, *McGill University*

GT-2023, 109924: Characterization of Differential Diffusion Effects for Lean, Premixed, Hydrogen-Enriched Flames in 3-D Metal-Printed Low-Swirl Burner

Byoung Woo Lim, *korea university*

GT-2023, 109316: Effects of Injection Angle on Film-Cooling Effectiveness of Slot-Type Holes in a Partial Cavity Tip

Cheng Ji, *Xi'an Jiaotong University*

GT-2023, 108785: Optimization and Aerodynamic Sensitivity Analysis of Non-Axisymmetric Hub of Centrifugal Impeller

Christopher Loving, *UCF*

GT-2023, 110172: Characterizing the Safety Limits for the Development of Hydrogen Gas Turbines

Cristian Avila, *KAUST*

GT-2023, 109779: Pilot Flame Effect on the Structure of Turbulent Nh3-Ch4-Air Swirl Flames at Atmospheric Pressure Using a Reduced-Scale Burner

Dahae Jeong, *Pennsylvania State University*

GT-2023, 110238: Cfd Analysis of Fluid Flow Over a Straight Five-Hole Probe

David Zamora, *Vasu Labs*

GT-2023, 110328: Combustion Strategies for Ammonia Aircraft Gas Turbine Engines

Deokhyoung Kim, *Changwon National University*

GT-2023, 109854: Optimized Double-Wall Cooling Structure for High-Temperature Turbine Inlet Temperature

Ena Badžek, *Institute of Thermal Turbomachinery and Machine Dynamics, Graz University of Technology*

GT-2023, 110019: Impact of Varying Parameters of Combustor Hot Streaks on a Turbine Center Frame

Hatam Hardani, *Department of Mechanical Engineering,* Ahvaz Branch, *Azad University*

GT-2023, 109894: Investigating the Optimization and Increasing the Efficiency of Cyclone Dust Collectors Using the Combined Method With Bag Filter and Electrostatic Precipitator Dust Collectors

Homin Lim, *Hanyang University*

GT-2023, 110370: Performance Predictions of Water-Lubricated Hydrostatic Thrust Bearings

Hwabhin Kwon, *Chang Won National University*

GT-2023, 109650: Effect of Degradation of Thermal Barrier Coatings on Cooling Performance of Gas Turbine Vanes

Hyung-Hee Cho, *Yonsei Univ*

GT-2023, 110291: Net Heat Flux Reduction of Film Cooling on the Nozzle Endwall With Purge Flow and Upstream Misalignment

Hyung-Hee Cho, *Yonsei Univ*

GT-2023, 110301: Heat Transfer Analysis of Subcritical Carbon Dioxide Jet Impingement on Submerged and Unconfined Flat Surface

Hyunsung Jung, *Hanyang Unversity*

GT-2023, 110368: Floating Sleeve Hydrostatic Journal Bearings: Measurements of Static Load Characteristics and Comparisons to Conventional Hydrostatic Journal Bearings

James Cartlidge, *University of Oxford*

GT-2023, 109950: Scaling of Overall Cooling Effectiveness From Laboratory to Engine Conditions

James Twaddle, *Purdue University*

GT-2023, 110025: Experimental Assessment of a Trans-Sonic Rossiter Cavity in the Development of Acoustic Streaming

Jiyong Choi, *Multi-physics modeling and computation lab in Yonsei university*

GT-2023, 110308: Effect of Hole Arrangement at Profiled Endwall on Film Cooling Effectiveness

Jose Garcia, *KTH*

GT-2023, 110325: The Role of Combined Cycle Gas Turbines as an Energy Storage Solution in a Hydrogen Economy

Joseph Counte, *Sensor Coating Systems Ltd*

GT-2023, 109838: A Novel Approach for Temperature Mapping in Non-Dedicated Engine Tests Using Thermal History Coatings

Kevin Boes, *Purdue*

GT-2023, 110036: Mach 6 Water Table With Shock Generator

Kingsley Atomboh, *Colorado State University*

GT-2023, 110369: Development of Advanced Hydrogen Fueled Gas Turbine Combustion System.

Liam Boyd, *Penn State University*

GT-2023, 110173: Novel Cooling Designs in Additively Manufactured Microchannels

Thank you 2023 Turbo Expo Poster Judges!

The ASME IGTI Student Advisory Committee would like to take this opportunity to thank the Turbo Expo Student Poster Judges for their diligent and meticulous judging efforts.

Tim Allison

Southwest Research Institute

Raghu Kancherla

Power Systems Mfg. LLC.

Angela Serra

Baker Hughes

Martina Ricci

Baker Hughes

Ward De Paepe

University of Mons (UMONS)

Lubomir Ribarov

United States Merchant Marine Academy

Klaus Brun

Elliott Group

Clement Joly

SoftInWay

Andrew Nix

West Virginia University

Marzuqa Ahmed, *University of Central Florida*

GT-2023, 110275: Investigation of Nox Emissions From Ammonia-Hydrogen Fuel in Aircraft Gas Turbine Engines

Meng Du, *University of Chinese Academy of Sciences*

GT-2023, 108340: Heat and Mass Transfer Characteristics and Influencing Factors of Micro-Nano Pores in Air Injection Enhanced Oil Recovery of Shale Reservoirs Based on Online Ct and Nmr

Nicolas Krajnc, *Technical University Graz*

GT-2023, 109900: The Impact of Different Inflow Complexity Levels on the Outflow of a Turbine Vane Frame.

Pratikshya Mohanty, *Pennslyvania State University*

GT-2023, 109202: Impact of a Central Pilot Jet on the Stability of a Swirling Flow

Ryan Smith, *Liburdi Turbine Services*

GT-2023, 109802: Metallurgical Performance Comparison of Oem and After-Market 7fa Stage 1 Buckets

Sean Hanrahan, *The University of Melbourne*

GT-2023, 110276: Predicting Transitional and Turbulent Flow Around a Turbine Blade With a Physics-Informed Neural Network

Seokmin Kim, *University of Science and Technology*

GT-2023, 109863: Large Eddy Simulations on Fan-Shaped Film Cooling Hole With Various Upstream Conditions

Sowmya Raghu, *UofSC*

GT-2023, 104260: Sr-30 Gas Turbine Engine Digital Twin

Taha Sherif, *Faculty of Engineering - Menoufia University*

GT-2023, 108153: Design Optimization, System Modeling and Dynamic Analysis of Vertical-Axis Wind Turbine Composite Blades

Tonghua Jia, *Xi'an jiaotong University*

GT-2023, 107927: Study on Under-Deposit Corrosion of Circulating Cooling Water Pipeline in Oil Refining Unit

Troy Krizak, *The Ohio State University*

GT-2023, 109718: Reduced Order Modeling of a Bladed Disk With Under-Platform Dampers

Valeria Pinto, *Politecnico di Torino*

GT-2023, 110344: The Impact of Contact Mistuning on Mode Shape Variation in Bladed Disks

Vamsikrishna Undavalli, *University of Alabama*

GT-2023, 109049: Numerical Modeling of Ammonia Combustion Characteristics for Gas Turbine Application

Yuan Fang, *University of Melbourne*

GT-2023, 110294: A Data-Driven Approach for Generalizing the Laminar Kinetic Energy Model for Separation and Bypass Transition in Low- and High-Pressure Turbines

Zakria Toor, *King Fahd University of Petroleum and Minerals*

GT-2023, 106420: Parametric Design of Leading Edge Micro Cylinder for Power Augmentation of H-Type Vertical-Axis Wind Turbines

Session Participant Information

*NEW SESSION ORGANIZER INFORMATION APP

Session Organizers

The conference application contains all the information you need to run your session: Session Chair and Co-Session Chair guidelines, digital evaluation forms and speaker bios. Please be sure to download the app before the start of the conference.

Certificates

Session Organizer certificates and PDH certificates will be emailed to you one month after the conference ends.

Presentation Uploads

Presenters (authors, panelists, tutorial instructors, lecturers) should plan to upload their presentations only on the computer in their session room. Please arrive 15 to 30 minutes prior to your session to upload your presentation. Presentations may be uploaded from a USB flash drive. There will not be a central network server for the sessions. **It is recommended that presentations be removed from the computer as soon as the presentation has ended.

Audiovisual Equipment Provided

Standard AV equipment provided in meeting rooms: LCD Projector, Laptop Computer, Projection Screen, Microphone(s), Wireless Remote/Laser Pointer and Microphone. Aspect Ratio is 16:9

Speaker Ready Room

Sunday, June 25	*3:00 pm – 6:00 pm*
Monday, June 26	*7:00 am – 5:30 pm*
Tuesday, June 27	*7:00 am – 5:30 pm*
Wednesday, June 28	*7:00 am – 5:30 pm*
Thursday, June 29	*7:00 am – 5:30 pm*
Friday, June 30	*7:00 am – 12:00 pm*

Registration

As a non-profit organization, ASME requires all presenters to register for the conference and pay an appropriate fee. We are pleased to offer all presenters the discounted ASME Member registration rate.

Badge Ribbons

Role and attendance ribbons are available on the ribbon wall in the Registration area. See the display for available options.

Need Assistance?

ASME staff (red badges) and Hall Monitors are circulating the session room hallways to provide assistance as needed.

Exhibition Information

Closing Ceremony and Kick-Off to London 2024

EXHIBITION HALL: EXHIBITOR THEATER STAGE
THURSDAY, 1:00 PM - 2:15 PM

Stop by the exhibition on Thursday at 1pm for your chance to win one of the People's Choice cash prizes. To be eligible for a cash prize, vote for the Exhibition Best Large and Small Displays and the People's Choice Student Poster. Voting systems are setup at the Posters as well as the entrance to the exhibition.

Enter for a chance to win 1 of 3 USD cash prizes by Casting Your Ballot for the People's Choice Best Booth Award Winners.

$100 **$250** **$500**

Three cash prize winners will be announced during the Closing Ceremony in the Exhibit Hall on Thursday, 1:00 pm.

Cast Your Ballot for:

- Most creative display design
- Best display of technology
- Best overall exhibit
- Best method of crowd attraction

One vote per attendee. Entrant must be present to win at the Closing Ceremony. To qualify for the prize drawings, votes must be cast by 6:30pm on Wednesday.

Stop by the ASME Turbo Expo 2024 Booth in the Hall and pick up London collateral and plan your trip to the 69th Turbo Expo June 24-28, 2024 – London.

TE Exhibit Advisory Committee Roster

Mission: To assist in the growth and expansion of the Turbo Expo exhibit with continued support to exhibiting companies and ASME expositions staff. Representatives serve as experts for fielding questions and providing resources and initiatives for continued success of the exposition.

JT Stone
MMP Technology/ BINC Industries
Term: 2022-2026

Kate Guerrina
Concepts NREC
Term: 2020-2024

Dr. Jakob Hermann
IfTA Systems GmbH
Term: 2018-2026

Dr. Leonid Moroz
SoftInWay Inc.
Term: 2018-2023

Kristin Barranger
ASME
barrangerk@asme.org
Term: Staff Liaison

If you are interested in joining this committee, contact Kristin Barranger at igtiexpo@asme.org.

Exhibition Floor Plan

Exhibitor Listings

We look forward to seeing you in the exhibition hall. Be sure to stop by and visit with the exhibitors and sponsors. For more information on the exhibitors, download the Conference app today. Exhibitor full listings and an interactive floor map are available. You can also plan your visit in advance with marking favorites and must-see companies.

BOOTH 532

Aalberts Surface Technologies-Accurate Brazing

USA

www.aalberts-ab.us

Aalberts surface technologies-Accurate Brazing is your true partner for thermal processing solutions including HPHT HIP, stress relief, heat treatments, and vacuum brazing for IGT, Additive Manufacturing, Aerospace, Investment Castings,and others.

BOOTH 606

ADS CFD Inc.

UK

www.adscfd.com

Aerospace CFD you can count on.

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BOOTH 401 HIRING

Advanced Design Technology Ltd.

UK

www.adtechnology.com

ADT's software gives you full control of the aerodynamic design process to revolutionize your turbomachinery components.

BOOTH 622

Aerodyn Ltd

UK

www.aerodyn-global.com

Aerodyn have extensive experience in serving the Aerospace, Power Generation, Defense, and Industrial markets. We specialize in slip rings, design and analysis, precision manufacturing, instrumentation, assembly, component and subsystem test, in-house and on-site validation, and test support.

BOOTH 633

Aeroprobe Corporation

USA

www.aeroprobe.com

Aeroprobe is a leading producer of air data and flow measurement systems for the turbomachinery industry around the world. Our precision manufactured Multi-Hole probes and rakes have been trusted by designers, engineers, and researchers since 1993.

BOOTH 623

AIKOKU ALPHA Corporation

USA

www.aikoku.co.jp/en/

AIKOKU ALPHA is one of the world's most sought-after manufacturers of the structural aerospace components, engine parts, and impellers that require this sophisticated technology.

Ansys

BOOTH 405

ANSYS

USA

www.ansys.com

Take A Leap of Certainty with Ansys For more than 50 years, Ansys engineering simulation software has enabled innovators across industries to push boundaries using the predictive power of simulation. The next great leaps in human advancement will be powered by Ansys.

BOOTH 411

APEX Turbine Testing Technologies

USA

www.apexturbine.com

APEX Turbine Testing Technologies is a supplier of turbomachinery test and analysis solutions with a proven record of delivering integrated, reliable, industry-leading software applications world-wide for over 20 years.

BOOTH 629

ARNOLD Group

Germany

www.arnoldgroup.com

We are your competent partner for innovative insulation systems and mechanical service solutions for industrial production plants.

BOOTH 829

ASME Headshot Lounge

Go by the Headshot Lounge and have a professional photo taken for social media, future award honors or, just because. It is free! Your company should sponsor the area in 2024!

BOOTH 715

ASME Recharge and Relax Station

Take some time to charge up electronics and play a game with a colleague or new friend. Rest, relax and recharge for the day!

BOOTH 823

ASME Turbo Expo 2024

USA

www.asme.org/events/turbo-expo

Pick up materials all about ASME Turbo Expo 2024 to be held in London.

BOOTH 729

ASME Turbo Expo 2024 Sales / Exhibitor Lounge

USA

www.asme.org/events/turbo-expo

Join us as a sponsor or exhibitor in London. Stop by to secure your spot!

BOOTH 714

Axiometrix Solutions

USA

www.axiometrixsolutions.com

Axiometrix Solutions, with the brands imc, Grass and Audio Precision, is a leading provider in the test and measurement space. Our customers span the world and can be found in most technology-intensive industries including aerospace, automotive. Our focus is to support testing and measurement set-ups in R&D, Production and Manufacturing as well as various kinds of Advanced Research.

BOOTH 734

BeCOVER

Belgium

www.becover.eu

BeCOVER is a test center designed for low and high pressure compressors for civil and military applications. With a power of 20MW, closed loop capability and dual / triple flow configurations, BeCOVER is capable of testing the future compressor configurations.

BOOTH 417

Cadence Design Systems Ltd.

USA

cadence.com/en_US/home.html

With Cadence technology, computational software expertise, and collaboration, our customers turn great ideas into reality faster.

BOOTH 527

Calspan Systems Corporation

USA

www.calspan.com

Calspan designs, manufactures and tests rigs and supplies engine test cells. We excel at our in-house capability to engineer, analyze, manufacture, instrument and assemble complex turbomachinery equipment. Calspan collaborates with our customers to develop test articles, prototypes and test facilities.

BOOTH 604

CAPTURE 3D, LLC

USA

www.capture3d.com

CAPTURE 3D, a ZEISS company With advanced measurement technology and intelligent software that quickly obtains accurate full part geometry, CAPTURE 3D's solutions rapidly solve engineering issues, prevent future problems, eliminate iterations, reduce costs and improve quality.

BOOTH 510

CEROBEAR GmbH

Germany

www.cerobear.com

CEROBEAR is a manufacturer of advanced, custom-engineered, build-to-print ball and roller bearings of all types for the Aerospace and Tech Industry. CEROBEAR serves applications like Aero-Engines & APUs, Aeroderivative Gas Turbines, Turbo Chargers, Turbo Pumps, ORC Turbines, Auxiliary Bearings.

BOOTH 513

CFturbo Inc.

USA

www.cfturbo.com

We are a Turbomachinery Software and Engineering company. Develop and sell Turbomachinery Software. Provide CAE Engineering Services.

BOOTH 432

Chentronics

USA

www.chentronics.com

Chentronics® provides innovative, High Energy Ignition (HEI) and flame detection technology for the power generation, utility, petrochemical, industrial, marine, and green environment industries. We offer unsurpassed direct, primary ignition expertise with a variety of fuels delivering to many different applications.

PUB BINS

COMPRESSORtech2

USA

www.compressortech2.com

Dedicated to global gas compression products and applications.

BOOTH 404 HIRING

Concepts NREC

USA

www.conceptsnrec.com

Concepts NREC is the only company in the world with end-to-end capabilities to take turbomachinery products from concept to reality. For more than 65 years, Concepts NREC has been at the forefront of turbomachinery design and innovation, providing engineering services, design software, CAM software, precision manufacturing, assembly, testing, training, and installation. Our mission is to provide the cutting-edge turbomachinery products, tools, and solutions the world needs for a sustainable future.

BOOTH 528

Convergent Science, Inc

USA

www.convergecfd.com

Convergent Science is an innovative, rapidly expanding computational fluid dynamics (CFD) company. Our flagship product, CONVERGE, is a revolutionary CFD software with truly autonomous meshing capabilities that eliminate the grid generation bottleneck from the simulation process.

BOOTH 340

Cross Manufacturing

UK

www.crossmanufacturing.com

Specializing in design, development and manufacture of high temperature metallic Sealing Rings, Retaining Rings and Brush Seals. Trusted by OEM's globally, providing precision high quality solutions for Aerospace, Automotive, Power Gen and many other industries by combining technology with innovation.

BOOTH 712

Dassault Systemes

USA

www.3ds.com

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual twin experiences' of the real world with our 3DEXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

BOOTH 411

datatel Telemetry

Germany

www.datatel-telemetry.de

datatel provides a wide range of turnkey telemetry systems to measure physical parameters on rotating components.

BOOTH 329

Deeplabs srl

Italy

www.deepyt.ai

Deeplabs provides cutting-edge AI solutions for designing and optimizing turbomachinery, enabling enhanced performance and faster product development.

BOOTH 722

DEWESoft LLC

USA

www.dewesoft.com

DEWESoft, offers a full suite of hardware for in-vehicle & lab applications. Scalable from 1-1000's of channels our instruments are small USB & EtherCat devices, stand-alone battery-powered systems, rack-mounted configurations, & ruggedized field-ready solutions.

PUB BINS

Diesel & Gas Turbine Worldwide

USA

www.dieselgasturbine.com

Covering large horsepower prime movers in the power generation, marine propulsion, oil & gas and rail markets.

BOOTH 423

e+a

USA

www.eandausa.com

Elektromaschinen und Antriebe (e+a) makes rotors and stators that OEM customers use to build motors and generators for high-speed, high-power embedded turbomachinery turapplications.

BOOTH 724

ECM USA, Inc.

USA

www.ecm-usa.com

The ECM Group manufactures VPA, VPC and FIC furnaces for Aeronautic (gas turbine blades, coatings, etc...) and other related market applications. These furnace systems are AMS compliant and globally commissioned utilizing diameters from 700-1500mm at temperatures that can exceed 1150°C.

BOOTH 641

Ergon Research

Italy

www.ergonresearch.it

Ergon Research is a consulting and research firm in the mechanical, energetic and informatics engineering field. Its mainstay is the integration between theoretical aspects and the most advanced simulation and experimental techniques in the thermo-fluid-dynamic field.

BOOTH 716

esg REVIEW

USA

www.esgreview.net

ESG Review is devoted to the environmental, social, and governance (ESG) strategies, technologies, and investments that companies are making to create sustainability over the long term. ESG Review is both a quarterly magazine and a weekly journal. ESG Review magazine is delivered in print and digital formats in February, May, August, and November. Free to subscriber, readers can choose their preferred delivery method (or both!). Esgreview.net is updated each Wednesday at noon CST with all new content. Bookmark the site today and never miss a story.

PUB BINS

ETN Global

Belgium

www.etn.global

ETN Global is a non-profit membership association bringing together the entire value chain of the GT technology. ETN encourages and facilitates information exchange and cooperation to accelerate R&D, and deployment of safe, affordable and dispatchable carbon-neutral energy solutions by 2030.

BOOTH 822;824

Exhibitor Meeting Room

Need a moment to speak privately? Exhibitors can reserve these rooms during the exhibition.

BOOTH 706 HIRING

Florida Turbine Technologies

USA

www.kratosdefense.com/about/divisions/turbine-technologies

We're a global leader in innovative energy and aerospace turbomachinery, specializing in the development of next generation gas turbines. We also provide engineering services, testing services, and material solutions for military and commercial engines, space propulsion, and industrial power-producing applications.

BOOTH 505

Flownex Simulation Environment

South Africa

www.flownex.com

Flownex Simulation Environment is a 1D engineering tool allowing users to combine detailed component models with integrated system simulation, opening new frontiers to state-of-the-art engineering simulations. Flownex is designed for easy workflow, performance optimisation with over 30 years experience and is certified to the ISO9001:2015 standard and is ASME NQA-1 compliant. Utilise Flownex to model thermal-fluid systems behaviour, evaluate multiple design configurations and the future impact of design decisions or investigate operations issues using real plant data and improve maintenance plans, saving you time and costs.

BOOTH 704

FOGALE Sensors

France

www.fogale.com/turbomachinery

Fogale Sensors is a world leader in the procurement, installation and maintenance of clearance and vibration measurement systems for gas turbine blades and shaft monitoring for aerospace and power applications.

BOOTH 333

Fracture Analysis Consultants, Inc.

USA

www.fracanalysis.com

Our mission is to provide state-of-the-art software and services in computational fracture mechanics to industry.

BOOTH 400

Franke Industrie AG

Switzerland

www.frankeindustries.com

When it comes to fabricated and machined components, Franke Industries is your reliable partner within the Energy, Aerospace, Space and other specialized industries. With experience since 1950, we inventively support your projects from the first concept to the engine-ready component.

BOOTH 631

Friendship Systems AG

Germany

www.CAESES.com

CAESES is a software solution for the simulation-driven design of turbomachinery. CAESES combines a specialized CAD environment for generation of smart and efficient parametric models of turbomachinery components, an optimization platform, and coupling to external simulation tools.

BOOTH 519

GadCap Technical Solutions Ltd.

UK

www.capacisense.com

With over 30 years of experience, the GadCap CapaciSense system combines contactless blade tip clearance measurements and blade vibration monitoring using state-of-the-art high temperature captive capacitive probes.

GAS COMPRESSION magazine

BOOTH 716

Gas Compression Magazine

USA

gascompressionmagazine.com

Gas Compression Magazine provides in-depth coverage of the products, systems, technologies, and news that affect the global gas compression industry. Upstream, midstream, and downstream, Gas Compression Magazine is your source for gas compression news and information. Published monthly, Gas Compression Magazine is delivered to the people who manufacture, maintain, purchase, package, and teach gas compression products and systems. Offered in print and digital formats, readers can choose their preferred delivery method (or both!). Free to subscribe and free to renew, sign up today at gascompressionmagazine.com.

GTSJ

BOOTH 626

Gas Turbine Society of Japan

Japan

www.gtsj.or.jp/english

GTSJ aims to promote science, technology and social development through information exchange, publication, technology research and other activities in the fields of all types of gas turbines, and energy conversion systems.

BOOTH 534

GasTurb GmbH

Germany

www.gasturb.com

GasTurb is a powerful and flexible program for calculating design and off-design performance of gas turbines. It simulates the most common types of both aircraft and power generation turbines with a user-friendly graphical interface.

Gas Turbine World

PUB BINS

Gas Turbine World

USA

www.gasturbineworld.com

Gas Turbine World is the one industry publication that's GT-focused, globally-aware and dedicated to covering the development and application of industrial gas turbine power in all its forms.

GE Aerospace

BOOTH 535 HIRING

GE Aerospace

USA

www.geaerospace.com

GE Aerospace is a world-leading provider of jet engines, components and integrated systems for commercial and military aircraft. GE Aerospace has a global service network to support these offerings. GE Aerospace will build upon our established 100+ years of expertise, extensive partnerships, and commitment to customers. Together we will mobilize a new era of growth in aerospace and defense — one that balances the current needs of our industry with those of future generations, surpassing what is expected and delivering what is essential. Where others stop, we accelerate.

BOOTH 201

GPAINNOVA -Dlyte

USA

www.dlyte.com

GPAINNOVA is the inventor of the first and only dry electropolishing system for metal surface finishing, DLyte, that polishes metals without the use of harsh liquid chemicals. It is environmentally friendly and doesn't require expensive chemical waste disposal processes. It has improved corrosion resistance and proven biocompatibility, so it can be utilized for a wide range of metals and manufacturing needs.

BOOTH 435

GTI Energy

USA

www.gti.energy

Since 1941, GTI Energy has contributed to strengthening energy systems and the communities they serve. As a leading research and training organization, we focus on developing, scaling, and deploying energy transition solutions that improve lives, economies, and the environment.

BOOTH 515

Haynes International, Inc.

USA

www.haynesintl.com

Haynes International, Inc. is a leading developer, manufacturer, and distributor of HASTELLOY® and HAYNES® high-performance alloys for use in high-temperature and corrosion applications. Our primary markets include: Aerospace, Chemical Processing, and Industrial Gas Turbine industries.

BOOTH 610

Hyphen Innovations

USA

www.hyphenmade.com

Hyphen Innovations stands out by using additive manufacturing solutions to develop low-cost, damage-resistant systems for air defense, propulsion, and general aviation. We leverage techniques like laser powder bed fusion, metal FDM, metal binder processes, and laser wire fed DED while prioritizing affordability.

BOOTH 307

IfTA GmbH

Germany

www.ifta.com/en

Real-time measurement, analysis, long-term condition monitoring and protection solutions specialized on combustion dynamics, rotor dynamics and test beds.

BOOTH 437

IHI Bernex AG

Switzerland

www.ihi-bernex.com/en

Since their introduction in the 1970s, Bernex CVD systems have proven their reliability in hundreds of installations, providing hard, wear-resistant coatings for customers worldwide.

BOOTH 437

IHI Hauzer Techno Coating B.V.

Netherlands

ihi-bernex.com/en/about-bernex

With our robust systems, wide range of technologies, continuous innovative spirit and focus on partnership and lifetime support, Hauzer can be sure to add value to your sustainable products and services.

BOOTH 429

ILT TECNOLOGIE SRL

Italy

www.ilttecnologie.eu/en

ILT Tecnologie is dedicated to offer high-quality services for the fabrication of sheet metal parts with a wide range of sheet metals. ILT Energia produces Hydrogen and Oxygen Separate Gas Generators, PSA Nitrogen Generators for multiple industrial applications.

BOOTH 640

IPETRONIK Inc.

USA

www.ipetronik.com/en

IPETRONIK's highly precise measurement technology, rugged DAQ and recorders are used for engine test cells, flight tests and new propulsion system tests under extreme climate conditions. Our 96-channels temperature scanners, fuel/oil-flow, voltage/vibration/pressure are pylon mounted and save test cell time.

BOOTH 425

IPG Photonics

USA

www.ipgphotonics.com

IPG Photonics is the leading manufacturer of high-performance fiber lasers & systems that offer optimized laser welding, cutting and drilling for industrial applications. Headquartered in Oxford, MA, IPG is the global leader of fiber laser technology.

BOOTH 337

Kingsbury, Inc

USA

www.kingsbury.com

Kingsbury, in business since 1912, is the first and leading manufacturer of fluid-film thrust and journal bearings. With shaft sizes ranging from 25 to 1400 mm, and sliding velocities up to 130 m/sec. Please visit www.kingsbury.com for more details.

BOOTH 726

Kistler Instrument Corp.

USA

www.kistler.com

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Customers benefit from Kistler's experience as a development partner and its unique sensor technology, enabling them to optimize their products and processes so as to secure sustainable competitive edge.

BOOTH 526

Kulite Semiconductor Products, Inc.

USA

www.kulite.com

Globally recognized as the leading name in transducer technology, Kulite Semiconductor Products, Inc. maintains its edge with innovative research, ingenious designs and forward-thinking minds.

BOOTH 624

LG Tech-Link Global, LLC

USA

www.lgtechlinkglobal.com

Providing access and support services to a unique sensor technology that enables accurate max temperature measurement in hostile environments.

BOOTH 710

Life Prediction Technologies Inc

USA

www.lifepredictiontech.com

LPTi possesses the technology to develop Digital Twins for specific engine platforms that can be used for the predictive maintenance of durability critical and safety critical parts of the engine. The LPTi technology uses physics-based modeling approaches along with actual engine usage data to make the predictive maintenance decisions.

PUB BINS

Linquip Corp

USA

www.linquip.com

A professional network for equipment manufacturers, industrial customers, and service providers.

BOOTH 335

M+P International

USA

www.mpihome.com

Product designers and test engineers throughout the world trust m+p international for reliable noise and vibration testing solutions. Our state-of-the-art products meet the highest demands on quality and reliability and have a significant market share in numerous key industries worldwide.

BOOTH 434

Main-Metall International AG

Switzerland

www.main-metall.com

Main-Metall is a developer, producer and supplier of a wide range of plain bearings for more than 90 years. Internally developed products and manufacturing processes based on research and technical know-how have made us an eagerly sought after business partner.

MECHANICAL ENGINEERING

PUB BINS

Mechanical Engineering Magazine

USA

www.asme.org/membership/mechanical-engineering-magazine

Mechanical Engineering® is the award-winning flagship publication of ASME.

BOOTH 541 HIRING

Miba Industrial Bearings

Austria

www.miba.com/en/product-areas/industrial-bearings

The Industrial Bearing Branch produces hydrodynamic bearings and labyrinth seals for use in critical rotating equipment, such as turbines, compressors, generators, motors, and industrial pumps.

BOOTH 635

MIT Gas Turbine Laboratory

USA

gas-turbine-lab.mit.edu

The mission of the MIT Gas Turbine Laboratory is to advance the state-of-the-art in aerospace power and propulsion by creating impactful solutions important to society with emphasis on innovative, novel, [illegible] approaches.

MMP TECHNOLOGY

BOOTH 311

MMP Technology

USA

www.mmptechnology.com

MicroTek Finishing's Micro-Machining Process (MMP) is the only surface finishing technology of its kind in the world. Whether your goal is a specific reduction in surface roughness (i.e., an engineered surface) or a highly consistent aesthetic result (i.e., a mirror-like finish), MMP produces perfectly controlled surface states through an industrial process that is both repeatable and traceable across a wide range of materials. MicroTek Finishing's MMP is unique in its ability to selectively remove specific components of roughness evenly across the entire surface of the part. Please feel free to contact us to discuss your Advanced Superfinishing needs.

PUB BINS

Modern Power Systems

UK

www.modernpowersystems.com

The international monthly magazine Modern Power Systems provides in-depth independent coverage of power plant and transmission and distribution technology. Widely read throughout the world of electricity generation, it specialises in presenting key engineering and commercial developments in an authoritative but accessible style. From advanced power plant and transmission design to repair and maintenance case studies, Modern Power Systems is unrivalled as a platform for exploring cutting edge developments in the power industry.

BOOTH 530 HIRING

MTU Aero Engines AG

Germany

www.mtu.de

MTU is a specialist in stationary industrial gas turbines and offers its customers worldwide the full range of first-class performance and services.

BOOTH 317

National Aeronautics and Space Administration (NASA)

USA

www.nasa.gov

NASA Aeronautics is engaging with industry, academia, and other agencies to advance turbine engine technologies to meet the extreme challenge of aviation decarbonization. Visit the NASA booth to learn about our turbine work in the Sustainable Flight National Partnership.

BOOTH 615

National Energy Technology Laboratory (NETL)

USA

www.netl.doe.gov

The National Energy Technology Laboratory is a U.S. Department of Energy national lab driving innovation to ensure affordable, abundant, and reliable energy that drives a robust economy and national security while developing technologies to manage carbon across the full life cycle and enabling environmental sustainability.

BOOTH 628 HIRING

NDTL Propulsion and Power

USA

www.ndtl.nd.edu

NDTL is a research and development organization focused on large-scale, high-energy, high-complexity testing and leading-edge computational and analysis capabilities to develop advanced technologies for conventional and high Mach air-breathing propulsion, energy generation, advanced thermal management, and energy storage solutions.

BOOTH 740

New Way Air Bearings

USA

www.newwayairbearings.com

Since 1994, New Way Air Bearings has been the market leader in Porous Media™ air bearing technology. Here's where you'll see real customer applications, get a sense of how the product performs and possibly spark creative ideas for your next design!

BOOTH 618

OROS

France

www.oros.com

OROS designs and manufactures noise and vibration testing systems (instruments and software) for more than 35 years, meeting the requirements and expectations of automotive, aerospace, marine energy & process, manufacturing and automation industries.

BOOTH 331

Oxsensis Ltd

UK

www.oxsensis.com

Oxsensis Ltd. is a UK-based company that develops fibre optic sensing technology for use in extreme environments. They offer bespoke sensing solutions capable of withstanding high temperatures and pressure with benchmark accuracy ideal for gas turbine, hydrogen, and oil and gas industries.

BOOTH 732

Pal-Con, LTD

USA

www.palconltd.com

Pal-Con, LTD. specializes in Gas Turbine Regenerators/Gas Turbine Recuperators. We offer consulting, evaluations, insulation, piping, manufacturing, rebuilding and refurbishing gas turbine regenerators for gas and electrical companies worldwide.

BOOTH 522

Parker Hannifin Corporation

USA

www.parker.com

Parker is the world's leading diversified OEM of Motion, Flow & Process Control, Filtration and Sealing technologies.

BOOTH 512

PCA Engineers Limited

UK

www.pcaeng.co.uk

PCA Engineers Limited is a UK consultancy specialist in aero-mechanical design of turbomachinery and the supply of engineering software. Experienced in radial and axial flow technologies, PCA has supported many of the world's leading manufacturers for over 30 years.

BOOTH 531

PCC Metals Group

USA

www.specialmetals.com

Special Metals Corporation is the world's premier inventor, developer and producer of nickel alloy and cobalt alloys.

BOOTH 536

Penn State University

USA

www.sites.psu.edu/gtreo

Penn State's Center for Gas Turbine Research, Education, and Outreach unites the broad expertise of its faculty to work closely with industry and government partners in sustainable aviation and power generation and educate the next generation of engineers and scientists.

BOOTH 612

Photron USA, Inc.

USA

www.photron.com

Used in internationally renowned research laboratories, industrial test facilities and universities in more than 30 countries, Photron FASTCAM high-speed cameras are trusted to provide high quality results in the most challenging high-speed applications.

PIEZOCRYST
ADVANCED SENSORICS GMBH

BOOTH 428

Piezocryst Advanced Sensorics GmbH

Austria

www.piezocryst.com/en/

Piezocryst is a leading company in high temperature dynamic pressure sensing. Our sensors are designed to directly measure pressure pulsations in gas turbine combustors to obtain optimal data for machine protection and combustion control over the entire lifetime.

BOOTH 422

Präwest Präzisionswerkstätten GmbH & Co. KG.

Germany

www.praewest.com

Twenty-four hours a day, 365 days a year, we are meeting the challenges of our customers in our workshop with its ultra-modern machine park. A relationship of mutual trust has grown between ourselves and our customers based on decades of successful cooperation. The basis for this is our highly qualified and motivated staff.

BOOTH 436

Precision Filters, Inc.

USA

www.pfinc.com

(PFI) is a global provider of high-performance instrumentation for test measurements.

BOOTH 625

Renishaw, Inc.

USA

www.renishaw.com

Renishaw is a global company with core skills in measurement, additive manufacturing, motion control, and precision machining. Driven by the goals of Industry 4.0, we help our customers control their manufacturing processes with a wide range of Industrial Metrology technologies.

BOOTH 517

Riverhawk Company

USA

www.riverhawk.com

Rotating equipment components and solution offerings including diaphragm couplings, hydraulic bolt tensioners and hardware, taper hub Installation tooling, torque management technology (including torque meters), and a full state-of-the-art coupling repair service center located in Upstate New York.

BOOTH 507

Scanivalve

USA

www.scanivalve.com

Scanivalve's line of Ethernet pressure and temperature measurement equipment serve applications in aerospace, power generation, turbomachinery, automation, process control, wind turbines, wind tunnels and more. Let us use our years of experience and innovation to meet your physical measurement requirements.

BOOTH 323

Sensor Coating Systems Limited

UK

www.sensorcoatings.com

SCS are pioneers in high definition thermal mapping. The award-winning technology enables accurate temperature detection and, in doing so, assists in optimising the operation of machinery, lowering fuel costs and maintaining material integrity.

BOOTH 619

Sensorade

Belgium

www.sensorade.eu

SENSORADE is specialized in ultra-miniaturized pressure sensors for harsh environments. This unique technology served the Wind Tunnel and Testing Engineering community. SENSORADE is the only OEM offering the smallest (1.2mm) sensor with the highest performance in the world.

BOOTH 741

Sesta Lab

Italy

www.sestalab.com

Sesta Lab is an industrial area to test combustion system for gas turbine. The test size is between 1MW to 100MW in particular conditions. Sesta Lab is leader in fuel flex thanks to syngas systems, hydrogen, and many others. One of our test cell has optical analysis instrumentations.

BOOTH 608

Shaft Current Solutions, DBA Sohre Turbomachinery

USA

www.sohreturbo.com

Protecting rotating equipment from the damaging effects of stray shaft electrical currents. Sohre Turbomachinery® grounding brushes use a proprietary silver and gold fiber technology. Continuous protection in adverse conditions, our brushes are the preferred long term, low maintenance choice.

BOOTH 602

Siemens Energy

USA

www.siemens-energy.com

A global team of more than 91,000 dedicated employees. Together, we're responsible for meeting the growing energy demand while ensuring our climate is protected. We keep the best of our 150-year legacy & push the boundaries of what is possible.

BOOTH 708

SimScale GmbH

Germany

www.simscale.com/simulations/turbomachinery-cfd

Cloud-native turbomachinery simulation with practically unlimited computing power. SimScale's Subsonic CFD Solver and Body Fitted Cartesian Meshing are highly parallelized and optimized for cloud computing. Get the simulation performance you've dreamed of plus "live" 24/7 customer support. Open your browser and get to work

BOOTH 600

SoftInWay Inc.

USA

www.softinway.com

SoftInWay is an international R&D engineering company specializing in the development of clean, efficient, reliable turbomachinery & propulsion systems. SoftInWay supports its customers through its integrated & automated software platform, AxSTREAM ® for all steps in the turbomachinery design, redesign, analysis, & optimization process. We also offer a number of engineering services & educational courses. SoftInWay is ISO 9001:2015 & AS9100:2016 certified, and we support 500+ global customers including companies, research labs/universities & government organizations.

BOOTH 424 HIRING

Southwest Research Institute

USA

www.swri.org

Southwest Research Institute® (SwRI®) performs turbomachinery research, development, and testing for power generation, gas compression, industrial manufacturing, and propulsion applications.

BOOTH 614

SpaceX

USA

www.spacex.com

MAKING HUMANITY MULTIPLANETARY. Building on the achievements of Falcon 9 and Falcon Heavy, SpaceX is working on a next generation of fully reusable launch vehicles that will be the most powerful ever built. SpaceX's Starship spacecraft and Super Heavy rocket – collectively referred to as Starship – represent a fully reusable transportation system designed to carry both crew and cargo to Earth orbit. Powered by 33+6 Raptor engines using sub-cooled liquid methane and liquid oxygen, Super Heavy and Starship fully reusable and will re-enter Earth's atmosphere to land back at the launch site. At SpaceX, we are designing and developing the next generation of turbopumps for the Raptor engine, the propulsion system that will take human to the Moon, Mars and beyond.

BOOTH 416

TEES - Turbomachinery Laboratory

USA

www.tps.tamu.edu

The Turbomachinery and Pump Symposia (TPS) serves as the premier training and networking opportunity for professionals in both pump and turbomachinery industries. TPS 2023 will be held September 2023 at the George R. Brown Convention Center in Houston, Texas. The annual event combines a world-class program with an international exhibit hall. Each year the event attracts more than 4,500 people and 350 exhibiting companies from 48 countries.

BOOTH 426

TEMA ENERGY srl

Italy

www.tema-energy.it

Competent and reliable Partner for manufacturing of Gas Turbine parts and components for the Oil & Gas and Power Generation Industry. We produce Gas Turbine Burners and Combustors Transition Pieces and mechanical parts like Nozzles.

BOOTH 613

Texys America, LLC

USA

www.texysgroup.com/en

For 20+ years, TEXYS GROUP has been designing, developing, manufacturing and distributing embedded and laboratory solutions to measure physical quantities and is praised worldwide for mastering various technologies such as infrared and fiber optics through main brands TEXENSE® and OPTEL-TEXYS.

BOOTH 615

The Office of Fossil Energy and Carbon Management (FECM)

USA

www.energy.gov/fecm

FECM's mission is to minimize the environmental impacts of fossil fuels in a just and sustainable way while advancing net-zero emissions by using research, development, demonstration, and deployment approaches to manage carbon and other environmental impacts of fossil fuel production and use.

BOOTH 430

TNS Teknologi Ltd.

Norway

TNS Teknologi was established 2014 by Torleik Narve Stangeland, who is the sole owner and inventor of FURIA Gas Turbine. FURIA's vision is to take gas turbines to a whole new level of performance, offering emissions-free and environmentally friendly solutions.

BOOTH 523

Torquemeters Ltd.

UK

www.torquemeters.com

Pioneers in driveline development, Torquemeters designs and manufactures high-performance power transmission & measurement systems, for the test and performance monitoring of turbomachinery and high-performance rotating machinery applications, for the world's leading independent R&D organisations, aerospace & industrial turbomachinery companies.

BOOTH 427

Turbine Services

USA

www.turbineservices.com

Turbine Services Ltd. provides new replacement parts for GE and Westinghouse Gas and Steam Turbines. We ensure the same fit, form and function as the original OEM parts, with the highest quality and competitive pricing and lead times.

BOOTH 325 HIRING

Turbocam International

USA

www.turbocam.com

TURBOCAM specializes in manufacturing core turbomachinery flow path components for aviation, rocketry, automotive turbocharger, and power generation, offering bold and creative solutions to today's challenges. Design Partnership - Optimize manufacturing and life cycle cost and performance, from prototype to large scale production; Advanced Manufacturing – Five Axis and Electrochemical Machining, Metal Diffusion Treatments/Coatings; Advanced Materials - Stainless, Titanium, Nickel, and other high temperature Alloys; Global Reach - Manufacturing locations in the US, UK, Romania, and India with Global Supply Chain Connections.

BOOTH 736

Turboland

USA

Turboland is developing a state-of-the-art motorsport experience to spur passion in turbomachinery to the masses. In addition to an annual race, we offer advertising and sponsorship opportunities for companies to showcase the most innovative and sustainable technologies in aviation.

BOOTH 433

Turbostream Ltd

UK

www.turbostream-cfd.com

Ultra-fast CFD for turbomachines. New possibilities in turbomachinery design through the use of advanced simulation software running on GPUs.

BOOTH 540 HIRING

Tutco SureHeat

USA

www.tutcosureheat.com

TUTCO Sureheat electric heaters meets the demanding needs of high-temperature process heat applications. Our products have been integrated into a variety of OEM manufacturing processes and facilities worldwide.

BOOTH 305

University of Stuttgart, ITSM

Germany

www.itsm.uni-stuttgart.de/en

Research institute providing academic expertise on various aspects of turbomachinery such as aeromechanics, steam flows, radials and diffusing flows. Facing a tough blade vibration problem or developing machines for novel applications? Come and see us in Boston!

BOOTH 431 HIRING

USA Borescopes

USA

www.usaborescopes.com

Remote Visual Inspection Specialist.

BOOTH 511 HIRING

Vectoflow GmbH

Germany

www.vectoflow.de/en

Vectoflow makes standard and customized measurement solutions to determine the state of a flow! Our customized multi-hole-probes and fluid measurement solutions determine, e.g., pressure, velocity, flow angle, and temperature and can be easily customized using advanced additive manufacturing processes.

BOOTH 607 HIRING

Velo3D US

USA

www.velo3d.com

Velo3D is a technology company that helps innovators 3D-metal print their most ambitious designs. We provide an end-to-end solution, which is a combination of hardware, software, and underlying manufacturing process. Some of our customers include SpaceX, Honeywell, and Lam Research.

BOOTH 611

Visser Precision

USA

www.visserprecision.com

Founded in 2010, Visser Precision is an advanced manufacturing powerhouse based in Denver, Colorado. With over 50 multi-axis CNC spindles and 8 (DMLS) metal additive printers, coupled with a climate-controlled inspection lab and other value-added services.

BOOTH 718

Wärtsilä Bearing Centre

UK

www.wartsila.com

Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy markets.

BOOTH 605

Waukesha Bearings Corporation

USA

www.waukbearing.com

Custom-Engineered Fluid Film & Magnetic Bearing Solutions for High-Performing Rotating Equipment.

For the schedule of exhibitor presentations being held at the Exhibitor Theater in the Hall, visit

event.asme.org/Turbo-Expo/Program/Exhibitor-Theater

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TEMA ENERGY srl
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CAPTURE 3D, LLC
MMP Technology
PCC Metals Group
Penn State University
Präwest Präzisionswerkstätten GmbH & Co. KG.
Renishaw, Inc.
TEMA ENERGY srl

Aeroderivative Gas Turbine Repair & Overhaul

Chentronics
Cross Manufacturing
MMP Technology
Scanivalve
University of Stuttgart, ITSM

Air Systems

Aeroprobe Corporation
Cross Manufacturing
PCA Engineers Limited

Analytical

Aeroprobe Corporation
APEX Turbine Testing Technologies
CAPTURE 3D, LLC
Flownex Simulation Environment
M+P International
OROS
PCA Engineers Limited
Scanivalve
Texys America, LLC.
University of Stuttgart, ITSM

Ancillary Equipment

Cross Manufacturing

Automated 3D Inspection And Measurements

CAPTURE 3D, LLC
DEWESoft LLC
Renishaw, Inc.

Axial & Centrifugal Compressors

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BeCOVER
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FOGALE Sensors
FRIENDSHIP SYSTEMS AG
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Bearings, Seals & Lubricants

CEROBEAR GmbH
Cross Manufacturing
Main-Metall International AG
Miba Industrial Bearings
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Turbine Services

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Aeroprobe Corporation
IHI Hauzer Techno Coating B.V.
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PCC Metals Group
Sensorade
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Consulting & Engineering Services

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University of Stuttgart, ITSM

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Chentronics
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GadCap Technical Solutions Ltd.
IfTA GmbH
IPETRONIK Inc.
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Sensorade
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Texys America, LLC.
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Turbine Services

Design Process & Methodologies

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APEX Turbine Testing Technologies
FRIENDSHIP SYSTEMS AG
PCA Engineers Limited
Scanivalve
SoftInWay Inc.
Southwest Research Institute
Turbine Services
University of Stuttgart, ITSM

Drive Train Equipment

Cross Manufacturing
MMP Technology
PCC Metals Group
Torquemeters Ltd.

Education

Penn State University
Scanivalve
University of Stuttgart, ITSM

Expanders

AIKOKU ALPHA Corporation
Cross Manufacturing
FRIENDSHIP SYSTEMS AG
PCA Engineers Limited
PCC Metals Group
SoftInWay Inc.

Fans & Blowers

AIKOKU ALPHA Corporation
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FRIENDSHIP SYSTEMS AG
PCA Engineers Limited
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Precision Filters, Inc.
Scanivalve
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University of Stuttgart, ITSM

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Turbine Services

Fire Protection Systems

Turbine Services

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MMP Technology
PCA Engineers Limited
PCC Metals Group
Penn State University
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Precision Filters, Inc.
Scanivalve
Sesta Lab
SoftInWay Inc.
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Turbine Services
University of Stuttgart, ITSM

Gear Type Compressors

Cross Manufacturing
Cross Manufacturing
MMP Technology
PCC Metals Group

Laser and Optical 3D Scanning

CAPTURE 3D, LLC
TEMA ENERGY srl
University of Stuttgart, ITSM

Laser Drilling

IPG Photonics
TEMA ENERGY srl

Laser Machining

IPG Photonics

Laser Welding

IPG Photonics
TEMA ENERGY srl

Maintenance and Operation

Chentronics
FOGALE Sensors
Miba Industrial Bearings
Siemens Energy
Texys America, LLC.

Management & Maintenance of Rotating Equipment

APEX Turbine Testing Technologies
ARNOLD Group
Chentronics
FOGALE Sensors
IfTA GmbH
Miba Industrial Bearings
Scanivalve
Siemens Energy
Texys America, LLC.

Manufacturing Processes

IHI Hauzer Techno Coating B.V.
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PCC Metals Group
Präwest Präzisionswerkstätten GmbH & Co. KG.
Renishaw, Inc.
TEMA ENERGY srl
Turbine Services

Microscope Systems and Digital Imaging

TEMA ENERGY srl

Monitoring Software

Aeroprobe Corporation
APEX Turbine Testing Technologies
DEWESoft LLC
FOGALE Sensors
IfTA GmbH

IPETRONIK Inc.
OROS
Scanivalve
Texys America, LLC.
University of Stuttgart, ITSM

Oem Gas Turbine/Power Turbine

APEX Turbine Testing Technologies
ARNOLD Group
BeCOVER
Cross Manufacturing
e+a
GE Aerospace
MMP Technology
PCC Metals Group
Siemens Energy

Oil Systems

Cross Manufacturing
Flownex Simulation Environment
SoftInWay Inc.

Package/Turnkey Applications

APEX Turbine Testing Technologies
datatel Telemetry
FOGALE Sensors
Texys America, LLC.
Torquemeters Ltd.

Process Control Systems

Aeroprobe Corporation
FOGALE Sensors
Renishaw, Inc.
Scanivalve
TEMA ENERGY srl

Process Gas Screw Compressors

Cross Manufacturing
Scanivalve

Publication

Gas Compression Magazine
University of Stuttgart, ITSM

Publishing Company

Gas Compression Magazine

Service for Turbines & Compressors

APEX Turbine Testing Technologies
BeCOVER
Cross Manufacturing
FOGALE Sensors
Miba Industrial Bearings
MMP Technology
Scanivalve
SoftInWay Inc.

Software & Computer Hardware

Aeroprobe Corporation
ANSYS
APEX Turbine Testing Technologies
CAPTURE 3D, LLC
FOGALE Sensors
FRIENDSHIP SYSTEMS AG
IfTA GmbH
IPETRONIK Inc.
M+P International
PCA Engineers Limited
Precision Filters, Inc.
Scanivalve
SoftInWay Inc.
Southwest Research Institute
University of Stuttgart, ITSM

Solar

PCC Metals Group

Special Materials

Cross Manufacturing
MMP Technology
PCC Metals Group
Scanivalve
TEMA ENERGY srl

Steam Turbines

AIKOKU ALPHA Corporation
ARNOLD Group
Cross Manufacturing
Flownex Simulation Environment
FRIENDSHIP SYSTEMS AG
MMP Technology
PCA Engineers Limited
PCC Metals Group
Präwest Präzisionswerkstätten GmbH & Co. KG.
Precision Filters, Inc.
Scanivalve
Siemens Energy
SoftInWay Inc.
Turbine Services
University of Stuttgart, ITSM

Testing

Aeroprobe Corporation
ANSYS
APEX Turbine Testing Technologies
BeCOVER
Cross Manufacturing
datatel Telemetry
DEWESoft LLC
FOGALE Sensors
GadCap Technical Solutions Ltd.
IfTA GmbH
IPETRONIK Inc.
LG Tech-Link Global, LLC
M+P International
OROS
Penn State University
Precision Filters, Inc.
Scanivalve
Sesta Lab
Southwest Research Institute
University of Stuttgart, ITSM

Vacuum Heat Treating and Brazing Services

Aalberts surface technologies-Accurate Brazing
IHI Hauzer Techno Coating B.V.
Präwest Präzisionswerkstätten GmbH & Co. KG.

Wind Turbines

Cross Manufacturing
FOGALE Sensors
FRIENDSHIP SYSTEMS AG
Scanivalve

Closing Ceremony and Kick-Off to London 2024

EXHIBITION HALL: EXHIBITOR THEATER STAGE / THURSDAY, JUNE 29 / 1:00PM – 2:15PM

The Closing Ceremony recognizes several of Turbo Expo's volunteers and award recipients.

Join us in celebrating the following individuals:

- IGTI's Outgoing Committee Chairs
- Turbo Expo Early Career Engineer Travel Award Recipients (TEECE)
- Student Advisory Committee Travel Award Recipients (SACTA)
- Student Poster Session Winners (including People's Choice!)
- Turbo Expo 2024's Incoming Conference Chair

Stop by for your chance to win one of the People's Choice cash prizes. To be eligible for a cash prize, vote for the Exhibition Best Large and Small Displays and the People's Choice Student Poster. Voting systems are setup at the Posters as well as the entrance to the exhibition.

$100 $250 $500

Cast Your Ballot for:

- Most creative display design
- Best display of technology
- Best overall exhibit
- Best method of crowd attraction

One vote per attendee. Entrants must be present to win at the Closing Ceremony. To qualify for the prize drawings, votes must be cast by 6:30pm on Wednesday

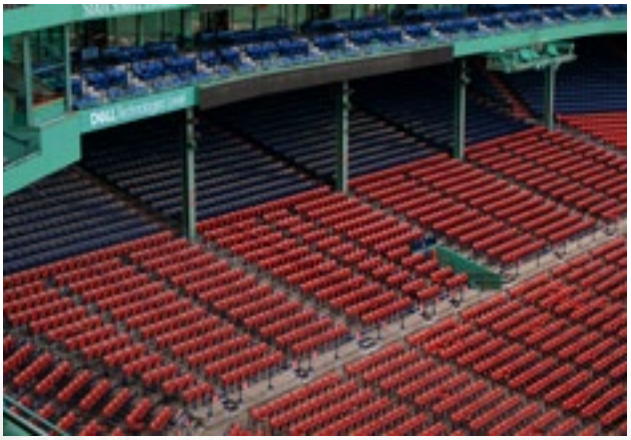
Stop by the ASME Turbo Expo 2024 Booth in the Hall to pick up London collateral and plan your trip to the **69th Annual Turbo Expo June 24-28, 2024 – London**.

BALLPARK TOUR | BOSTON, MA

Fenway Park Tour

SUNDAY, JUNE 25, 2023 AT 9:30A.M. EST

Though generations have come and gone, Fenway Park remains, much like it did the day it opened on April 20, 1912. Come to a game and find out why Fenway Park is "America's Most Beloved Ballpark." Tour will be a behind the scenes tour of Fenway Park!



Click Here to Register

FACILITY TOUR | LYNN, MA

GE Aerospace Tour

WEDNESDAY, JUNE 28, 2023 AT 8:00A.M. – 10:00A.M. EST

GE Aerospace's Lynn facility has a history that dates back more than 125 years and is recognized as one of the founding sites of the General Electric Company. The site is home to the first U.S. Jet engine (1942) and other prominent aviation industry milestones.

The Lynn plant is recognized as a U.S. Department of Defense facility that designs, produces, assembles, and test military and commercial aircraft engines and components. The site has supplied the U.S. armed services with engines since World War II, when it produced the country's first jet engine, the GE I-A. Today, roughly 70% of the facility's products are destined for military use, from turboshaft engines for helicopters to engines for fighter jets.

Tour will include engine museum visit, engine teardown demonstration, and engine assembly tour.

Click Here to Pre-Screen for Registration

FACILITY TOUR

BraytonEnergy

Brayton Energy Tour

TUESDAY, 27 JUNE, 2023 AT 9:00A.M. EST

Brayton Energy is an engineering company specializing in the design of turbomachinery, combustion, energy storage systems, and compact high-temperature heat exchangers including recuperators for microturbines and gas turbines. The facility houses many novel engine systems and specialized test rigs; examples include a 350 kWe intercooled recuperated gas turbine with ceramic hot section, counter-rotating axial turbomachinery for reversing Brayton cycle energy storage, and a concentrating solar power test facility with particle thermal storage. Project areas include gas turbines for alternative energy sources such as solar, biomass, nuclear and space power. The staff is nominally 50 engineers, technicians, and designers operating from a 4-acre campus in Hampton NH, providing engineering, design, fabrication, and test services.

The tour, including travel time, will be approximately 4 hours. A complimentary van will depart from the Sheraton Hotel at 7:45am and will arrive at Brayton Energy at 8:45am. The tour will be held from 9:00 to 10:30am and is restricted to 25 participants. Guests will be driven back to the Sheraton Hotel and can expect to arrive by 12:00pm.

Location: Brayton Energy, LLC., 75 Lafayette Road, Hampton NH 03842

Transportation: Van

Registration: See pre-registration form. As the numbers for this visit are restricted to 25, Brayton Energy may pre-screen participants.

Meals: Snack reception at end of tour.

More info: Contact Jim Kesseli at kesseli@braytonenergy.com (Ph: +1 603 601-0450)

Website: www.BraytonEnergy.com

Brayton Energy Tour Application

Brayton Energy, LLC. is hosting a tour 2023 ASME Turbo Expo delegates at their facility in Hampton, NH on Tuesday, June 27, 2023. A complimentary van will depart from the Sheraton Hotel at 7:45am and will arrive at Brayton Energy at 8:45am. The tour will be from 9:00 to 10:30am and is restricted to 25 participants. Guests will be driven back to the Sheraton Hotel and can expect to arrive by 12:00pm.*

Inquiries regarding this tour may be directed to: Jim Kesseli (*kesseli@braytonenergy.com*). Each delegate wishing to take the tour must complete the information below and return it no later than June 22, 2023.

Please Print:

First Name: _____

Last Name: _____

Job Title: _____

Company Name: _____

Address: _____

Telephone: _____

Date of Birth: _____

Date & Country of Issue: _____

Period of Stay (dates): _____

Submit to: Brayton Energy, LLC., Attn: Jim Kesseli, Email: kesseli@braytonenergy.com, Phone: +1 (603) 601-0450

*All tours are conducted at the discretion of the host company and under the conditions the company establishes. All tours are subject to cancellation.

IGTI Technical Committee Leaders

Aircraft Engine
Current Chair: Oscar Kogenhop
Current Vice Chair:
Prof. Dr.-Ing. Harald Funke

Ceramics
Current Chair: Rajesh S. Kumar
Current Vice Chair: Michael Presby
Incoming Chair: Michael Presby
Incoming Vice Chair: Spencer Jeffs

Coal, Biomass & Alternative Fuels
Current Chair:
Dr Marina Braun-Unkhoff
Current Vice Chair: Angela Serra

Combustion, Fuels & Emissions
Current Chair: Rudy Dudebout
Current Vice Chair:
Dr. Sebastien Ducruix
Incoming Chair: Dr. Sebastien Ducruix
Incoming Vice Chair:
Jacqueline O'Connor

Controls, Diagnostics & Instrumentation
Current Chair: Igor Loboda
Current Vice Chair: Dr. Lubomir A. Ribarov

Cycle Innovations
Current Chair: Panos Laskaridis
Current Vice Chair: Ward De Paepe
Incoming Chair: Ward De Paepe
Incoming Vice Chair: Alessandro Sorce

Education
Interim Chair and Vice Chair:
Mark Turner

Electric Power
Current Chair: Richard Tomlinson
Current Vice Chair:
Thomas Christiansen

Energy Storage Committee
Current Chair: David Sánchez
Current Vice Chair: Klaus Brun

Fans and Blowers
Current Chair: Zhiping Wang
Current Vice Chair: Till M. Biedermann

Heat Transfer
Current Chair: Atul Kohli
Current Vice Chair: Dr. Jay Rutledge

Industrial & Cogeneration
Current Chair: Clement Joly
Current Vice Chair:
Sergio M. Camporeale
Incoming Chair: Clement Joly
Incoming Vice Chair: Rakesh Bhargava

Manufacturing Materials & Metallurgy
Current Chair: Sascha Gierlings
Current Vice Chair: Scott Keller

Microturbines, Turbochargers & Small Turbomachines
Current Chair: Jose R. Serrano
Current Vice Chair: Aaron M. Rimpel
Incoming Chair: Aaron M. Rimpel
Incoming Vice Chair: Mihai Mihaescu

Oil & Gas Applications
Current Chair: Mauro Venturini
Current Vice Chair: Jason Wilkes
Incoming Chair: Jason Wilkes
Incoming Vice Chair: Michele Pinelli

Steam Turbine
Current Chair: Grant Ingram
Current Vice Chair: Kane Chandler
Incoming Chair: Shigeki Senoo
Incoming Vice Chair: Kane Chandler

Structures & Dynamics
Current Chair: Thomas Weiss
Current Vice Chair:
Mateusz Golebiowski

Student Advisory
Current Chair:
Dimitra Eirini Diamantidou
Current Vice Chair:
Mohammed Ibrahim Kittur

Supercritical CO_2
Current Chair: Nathan Weiland
Current Vice Chair: Timothy Allison
Incoming Chair: Timothy Allison
Incoming Vice Chair: Renaud Le Pierres

Turbomachinery
Current Chair: Luca Porreca
Current Vice Chair: Dr. Bronwyn Power
Incoming Chair: Dr. Bronwyn Power
Incoming Vice Chair: Hamid Hazby

Wind Energy
Current Chair:
Juan Carlos Jauregui Correa
Current Vice Chair: Giacomo Persico
Incoming Chair: Giacomo Persico
Incoming Vice Chair: Lorenzo Ferrari

Technical Committee Meetings

Committee	Day	Time	Room
Aircraft Engine	Thursday	6:00PM – 7:30PM	201
Ceramics	Wednesday	6:00PM – 7:30PM	202
Coal, Biomass & Alternative Fuels	Wednesday	6:00PM – 7:30PM	110
Combustion, Fuels & Emissions	Tuesday	6:00PM – 7:30PM	204
Controls, Diagnostics & Instrumentation	Wednesday	6:00PM – 7:30PM	108
Cycle Innovations	Thursday	6:00PM – 7:30PM	111
Electric Power	Wednesday	6:00PM – 7:30PM	201
Energy Storage	Tuesday	6:00PM – 7:30PM	108
Fans and Blowers	Wednesday	6:00PM – 7:30PM	111
Heat Transfer	Wednesday	6:00PM – 7:30PM	206
Industrial & Cogeneration	Thursday	6:00PM – 7:30PM	104
Manufacturing Materials & Metallurgy	Wednesday	6:00PM – 7:30PM	107
Microturbines, Turbochargers & Small Turbomachines	Wednesday	6:00PM – 7:30PM	204
Oil & Gas Applications	Thursday	6:00PM – 7:30PM	109
Steam Turbine	Wednesday	6:00PM – 7:30PM	109
Structures & Dynamics	Tuesday	6:00PM – 7:30PM	305
Student Advisory	Thursday	4:00PM – 5:30PM	107
Supercritical CO_2	Wednesday	6:00PM – 7:30PM	203
Turbomachinery	Tuesday	6:00PM – 7:30PM	312
Wind Energy	Thursday	6:00PM – 7:30PM	303

Revolutionary innovations will fuel the future

Because we believe the world works better when it flies

With the steadfast determination and means to successfully demonstrate a hydrogen propulsion system, we're committed to helping create zero emissions in flight.

This unrelenting desire to make a difference has led GE Aerospace and our partners to work with one of the world's leading aircraft manufacturers on plans to flight test a direct combustion engine fueled by hydrogen. The journey to decarbonize flight is full speed ahead.

See what we're doing today for the benefit of us all tomorrow.

GE Aerospace

geaerospace.com

Track Organizers

Track 01 - Aircraft Engine

Oscar Kogenhop, *Royal NLR - Netherlands Aerospace Centre*
Harald Funke, *FH Aachen*
Charles Krouse, *Southwest Research Institute*
Todd Lowe, *Virginia Tech*

Track 02 - Ceramics and Ceramic Composites

Rajesh Kumar, *Raytheon Technologies Research Center*
Mike Presby, *NASA Glenn*

Track 03 - Coal, Biomass, Hydrogen & Alternative Fuels

Marina Braun-Unkhoff, *DLR*
Angela Serra, *Baker Hughes*
Pietro Bartocci, *CRB*
Pierre Gauthier, *Siemens*
Francesco Fantozzi, *UNIPG*

Track 04 - Combustion, Fuels & Emissions

Mirko Bothien, *ZHAW Zurich University of Applied Sciences*
Santosh Hemchandra, *Indian Institute of Science*
Vishal Acharya, *Georgia Institute of Technology*
Rudy Dudebout, *Honeywell Aerospace*
Sebastien Ducruix, *CentraleSupelec*

Track 05 - Controls, Diagnostics & Instrumentation

Igor Loboda, *Instituto Politecnico Nacional, Mexico*
Lubomir Ribarov, U.S. Merchant Marine Academy
Liang Tang, *P&W*
Lorenzo Ferrari, *University of Pisa – DESTEC, Italy*
Dr. Craig Davison, *Institute for Aerospace Research (please add)*

Track 06 - Cycle Innovations

Panagiotis Laskaridis, *Cranfield University*
Ward De *Paepe, University of Mons (UMONS)*
Alessandro Sorce, *University of Genova*

Track 07 – Education

Mark Turner, *NASA*

Track 08 - Electric Power

Rick Tomlinson, *Chevron*
Thomas Christiansen, *Strategic Power Systems, Inc.*
Bin Jou, *FM Global*
Ben Emerson, *Georgia Institute of Technology*

Track 09 – Energy Storage

David Sánchez, *University of Seville*
Brun Klaus, *Elliot Group*
Tim Allison, *Southwest Research Institute*

Track 10 - Fans and Blowers

Zhiping Wang, *Morrison Products, Inc.*
Till Biedermann, *ISAVE - Institute of Sound and Vibration Engineering*
Giovanni Delibra, *Sapienza University of Rome*
Massimo Masi, *University of Padova – DTG*
Sybrand Johannes Van der Spuy, *Stellenbosch University*

Track 11 - Heat Transfer: Combustors

Antonio Andreini, *University of Florence*
Lorenzo Mazzei, *Ergon Research*
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 12 - Heat Transfer: Film Cooling

Ardy Riahi, *Honeywell Aerospace*
Silvia Ravelli, *University of Bergamo*
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 13 - Heat Transfer: General Interest/Additive Manufacturing Impacts on Heat Transfer

Lesley Wright, *Texas A&M University*
Hariki Kahveci, Middle East Technical University
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 14 - Heat Transfer: Internal Air Systems

Carl Sangan, *University of Bath*
Cosimo Bianchini, *Ergon Research*
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 15 - Heat Transfer: Internal Cooling

Robert Krewinkel, *MAN Diesel & Turbo SE*
Hongzhou Xu, *Solar Turbines Inc.*
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 16 - Heat Transfer: Tutorials

Riccardo Da *Soghe, Ergon Research*
Sanjay Chopra, *GE Aviation*
James Rutledge, *Air Force Institute of Technology*
Steve Lynch, *The Pennsylvania State University*

Track 17 - Industrial & Cogeneration

Clement Joly, *SoftInWay, Inc.*
Sergio Camporeale, *Politecnico di Bari*

Track 18 - Manufacturing Materials & Metallurgy

Sascha Gierlings, *Fraunhofer Institute for Production Technology IPT*
Scott Keller, *Doosan Turbomachinery Services*

Track 19 - Microturbines, Turbochargers & Small Turbomachines

José Serrano, *Universitat Politècnica de València*
Aaron Rimpel, *Southwest Research Institute*

Track 20 - Oil & Gas Applications

Mauro Venturini, *Università degli Studi di Ferrara*
Jason Wilkes, *Southwest Research Institute*

Track 21 - Steam Turbine

Grant Ingram, *Durham University*
Kane Chandler, *GE Power*

Track 22 - Structures and Dynamics: Aerodynamics Excitation & Damping

Sina Stapelfeldt, *Imperial College London*

Track 23 - Structures and Dynamics: Bearing & Seal Dynamics

Jürg Schiffmann, *EPFL*

Track 24 - Structures and Dynamics: Emerging Methods in Design & Eng.

Partha Das, *Honeywell*

Track 25 - Structures and Dynamics: Fatigue, Fracture & Life Prediction

Alessandro Ramaglia, *Ansaldo*

Track 26 - Structures and Dynamics: Probabilistic Methods

Liping Wang, *GE Corp Research*

Track 27 - Structures and Dynamics: Rotordynamics

Ted Brockett, *Honeywell*

Track 28 - Structures and Dynamics: Structural Mechanics & Vibration

Azzedine Dadouche, *NRC Canada*

Track 29 - Student Advisory

Dimitra Eirini Diamantidou, *Mälardalen University*
Mohammed Ibrahim Kittur, *University of Malaya*
Dimitrios Bermperis, *Mälardalen University*

Track 30 - Student Posters

Dimitra Eirini Diamantidou, *Mälardalen University*
Mohammed Ibrahim Kittur, *University of Malaya*
Dimitrios Bermperis, *Mälardalen University*

Track 31 - Supercritical CO_2

Nathan Weiland, *NETL*
Tim Allison, *Southwest Research Institute*

Track 32 - Turbomachinery: Axial Flow Fan & Compressor Aerodynamics

Lisa Brilliant, *Pratt & Whitney*

Track 33 - Turbomachinery: Axial Flow Turbine Aerodynamics

Emil Göttlich, *Graz University of Technology*

Track 34 - Turbomachinery: Deposition, Erosion, Fouling, and Icing

Information forthcoming.

Track 35 - Turbomachinery: Design Methods & CFD Modeling for Turbomachinery

Mahmoud Mansour, Honeywell

Track 36 - Turbomachinery: Ducts, Noise & Component Interactions

Duncan Walker, *Loughborough University*

Track 37 - Turbomachinery: Multidisciplinary Design Approaches, Optimization, and Uncertainty Quantification

Marcus Meyer, *Rolls Royce Deutschland*

Track 38 - Turbomachinery: Radial Turbomachinery Aerodynamics

Hamid Hazby, *Mercedes AMG*

Track 39 - Turbomachinery: Turbomachinery General Interest

Bronwyn Power, *Pratt & Whitney*

Track 40 - Turbomachinery: Tutorials

Andres Peters, *GE Aviation*

Track 41 - Turbomachinery: Unsteady Flows in Turbomachinery

Reid Berdainer, *Pennsylvania State University*

Track 42 - Wind Energy

Juan Carlos *Jauregui, Autonomus University of Queretaro*
Giacomo Persico, *Politecnico de Milano*

Help us recognize this year's Outgoing Chairs and their volunteer service by attending the **Closing Ceremony** at 1:00 pm on Thursday, June 29 in the Exhibition Hall.

TURBO EXPO 2023

Registration Details

Turbo Expo will be held at the Hynes Convention Center, Boston, Massachusetts, USA June 26-30, 2023.

FULL CONFERENCE REGISTRATION INCLUDES:

Access to all conference sessions

including technical presentations, keynote sessions, panel discussions, tutorial of basics sessions, and award ceremonies

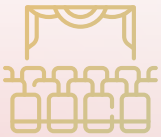
Admission to networking sessions

including the Welcome Reception, Student/Early Career Engineer Mixer & 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 2023 final accepted papers



Admittance into the Turbo Expo exhibition hall

Opportunity to attend facility tours

Lunches Monday-Thursday

Registration Pricing

PARICIPANT ONLY REGISTRATION (ASME MEMBERS)

Registration Category	REGISTER AFTER May 26, 2023
Member (5 Days)	$1,000.00
Member (3 Days)	$800.00
Lifetime (5 days)	$525.00
Student (5 days)	$525.00

PARICIPANT ONLY REGISTRATION (NON-ASME MEMBERS)

Registration Category	REGISTER AFTER May 26, 2023
Non-Member (5 Days)	$1,150.00
Non-Member (3 Days)	$825.00
Student Non-Member (5 days)	$575.00

PARTICIPANT ONLY – GROUPS AND SPONSORS

Registration Category	REGISTER AFTER May 26, 2023
Group 10+	$815.00
Group 20+	$775.00
Exhibiting Company Employee	$815.00
Platinum Sponsor Employee	$775.00

Registration Times

SUNDAY, JUNE 24
3:00 PM – 6:00 PM

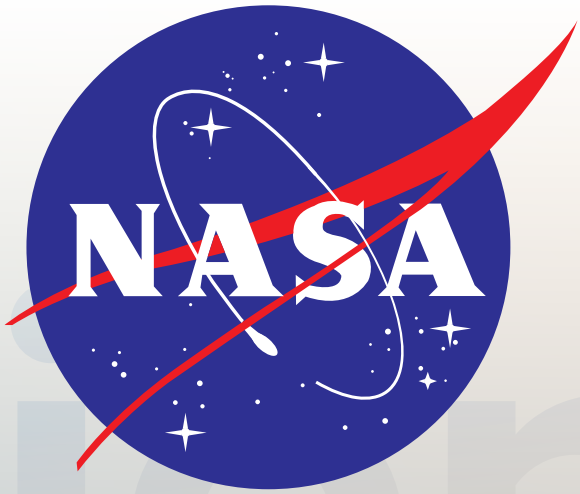
MONDAY, JUNE 26
7:00 AM – 5:30 PM

TUESDAY, JUNE 27
7:00 AM – 6:30 PM

WEDNESDAY, JUNE 28
7:00 AM – 6:30 PM

THURSDAY, JUNE 29
7:00 AM – 5:30 PM

FRIDAY, JUNE 30
7:00 AM – 12:00 PM



ADMITTANCE

Full Payment is required to attend Turbo Expo. Badges will not be given to anyone with an outstanding payment.

BADGE PICK-UP

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.

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 PDF 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.

PROFESSIONAL DEVELOPMENT HOURS (PDH)

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

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 RATES

Group registration is for groups of 10+ or 20+. Please contact igtiprogram@asme.org for assistance with group registration. All group registrations must be paid in full by June 3.

SUBSTITUTIONS

Registrations may not be transferred or substituted at any time

CANCELLATION/REFUND POLICY

- Cancellations received on or before May 26, 2023 will receive a full refund, less a $150 administrative fee.
- No refunds will be granted after May 26, 2023. NO EXCEPTIONS. No-shows will not be eligible for refunds.

PHOTOGRAPHS/VIDEO/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.

INSURANCE AND LIABILITY

Participation in Turbo Expo 2023 is at your own risk. Please make your own health and travel insurance arrangements.

AUTHOR REGISTRATION REQUIREMENTS

For each Technical Publication and Technical Presentation, a minimum of one author must be registered at the Full Conference Author rate.

CLICK TO REVIEW PUBLICATION REQUIREMENTS

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.

Frequently Asked Questions

Registration

Why didn't I receive any tickets with my badge?

The tickets and/or products you purchased with your registration are encoded onto your badge. Please wear this badge to all Turbo Expo related events.

Registration Questions:

Refer to the registration desk onsite.

Do you have a list of registrants?

ASME does not share attendee lists.

Is there a limit to the number of registrants accepted for Turbo Expo?

There is a limit of 2,500 personnel in the Convention Center.

We are planning to have registration available on-site, however it is best to register in advance to secure your entry into the conference.

Can I attend the Keynote Session?

The keynote session is open to all Turbo Expo badged registrants.

Can I pay cash onsite for the registration fees?

Yes. Payment must be made in USD. Exact change is preferred.

Will I receive a receipt onsite for the fees paid?

There is a registration receipt station in registration.

Do I need to pay to visit the exposition?

Exposition entry is included for all attendees with a technical conference badge or an exhibitor badge.

To purchase a badge on-site, visit the Registration Desk.

I lost my badge. What should I do?

Go to the registration counter and ask for another badge to be printed. Registrants must provide a proper ID.

Technical Program & Awards

Session and Schedule Details:

See complete session details in the Final Program or on the Conference App.

Am I supposed to get a CD-ROM/ DVD of Conference Papers?

No, there is no CD or DVD for the Conference. Conference papers are available online.

Where/when is my committee meeting?

Refer to the Final Program or the Conference App for the schedule.

What do the letters at the beginning of the session ID mean?

See the beginning of the technical session pages in the Final Program for the Session ID key.

What audiovisual equipment is in the meeting rooms?

Each room will have a laptop and microphone, and laser pointer. Authors must have their presentation on a flash drive.

Do I have to upload my presentation onto a central network before my session?

No. Presenters (authors, panelists, lecturers, tutorial instructors) should plan to use their flash drive presentations only on the laptop in the session room in which they will be presenting. Please arrive 15 to 30 minutes prior to your session to prepare your presentation.

Where do I pick up the Best Paper Awards for my committee?

Committee awards should be picked up by the designated leader at the Information Desk in Registration.

Exposition

Can I take pictures in the exhibit hall?

If you are an exhibitor, you may take pictures of your own booth. Otherwise, there is no photography allowed in the hall without the permission of the exhibitor.

Where is my booth?

Refer to the Exhibit Directory in the Final Program.

When is the Expo open?

Exhibit Hall Hours are Tuesday and Wednesday from 12:30-6:30pm and Thursday from 10am-12:30pm.

Where are the Priority meetings for Turbo Expo 2024 exhibit space?

IGTI Exhibit Sales Office in the exhibit hall.

Where is the exhibitor service contractor desk?

GES is available in the exhibit hall.

City & Venue

What about parking at the Hynes?

Within a three-block walk of the Hynes Convention Center are numerous parking garages totaling over 4,400 spaces. There is limited meter parking available around the Hynes and adjacent streets.

Where is the nearest metro/bus stop?

Taxi cabs can be hailed from the cab stand across the street from the Prudential Center, located just outside of the Boylston Street entrance to the Hynes.

The Massachusetts Bay Transportation Authority rail station is located at Huntington Ave and Belvidere St.

Is there a shuttle service between the convention center and my hotel?

The Sheraton Boston Hotel is connected to the Convention Center. Many of the hotels are within walking distance of the Hynes: the Marriott Copley, and Westin Copley are all connected to the Hynes through the Prudential Center/Mall.

For details on any other hotels, we recommend you contact the hotel directly.

Is there any Wi-Fi access at the Hynes?

There is complimentary Wi-Fi in the Hynes Convention Center. Network: Hynes Wireless Network (no password required).

Is there a bank or ATM close by?

Attendees can find an ATM on the lower level inside the Boylston Street Entrance of the Convention Center. There are also multiple ATMS available at the Prudential Center.

What business services are available?

There is a FedEx Office Print & Ship Center located in the Conference Hotel, the Sheraton Boston (which is connected to the Hynes Convention Center).

Where can I purchase coffee or lunch?

There are scheduled coffee/tea breaks each morning and afternoon of the Conference. Lunch is included with all technical conference badges as well as exhibitor badges. There are two options for dining available within the Convention Center (the Capital Grille and Rochambeau), as well as various dining options in the Prudential Center.

Where is the nearest grocery store?

There is a Trader Joe's located adjacent to the Convention Center at the intersection of Boylston St. and Gloucester St.

Where can I find information about the city of Boston, restaurants, and tourist information?

City information is available at the Signature Boston Desk located in the Registration Area.

Where can I get information on public transit services?

They are included in the Turbo Expo Final Program.

Attendee Services

Where are the first aid services?

For first aid assistance, contact an IGTI staff person or a security officer.

Is there a Luggage/Bag Check service available?

Ansys has sponsored a luggage/back check Wednesday to Friday. The bag drop is available for conference attendees and can be found in the registration area.

Are there any Spouse/Guest Tours, and where can I get tickets or information?

See the Final Program for details.

Is there a dedicated space for nursing mothers?

Yes. The nursing pod is located right off the Prudential Entrance at the South Rotunda.

Is there a dedicated space for prayer?

Room 822 in the Exhibit Hall is the designated space for prayer.

How do I become a member of ASME?

http://www.asme.org/Membership/Join/

Will I be issued a PDH certificate?

Technical Conference delegates will receive an email by August with a certificate of their attendance (Professional Development Hours).

How do I get involved in an IGTI Committee?

If you are interested in getting involved with an IGTI Committee, attend the Technical Committee Meeting of your choice. IGTI Committee meetings are open to all.

The Technical Committee Meeting Schedule can be found in the Final Program and the Conference App.

CHILDCARE SERVICES

We are pleased to offer childcare reimbursement for attendees of Turbo Expo 2023.

For those who need childcare services, ASME will reimburse up to a total of $250/per registered attendee for services incurred by a licensed service provider in Boston, Massachusetts.

This offering will be available from **June 26 - 30, 2023**, during the hours of days in which technical presentations are offered.

CLICK HERE TO LEARN HOW TO TAKE ADVANTAGE OF THIS BENEFIT

Tutorials of Basics

This year, industry experts from several committees will present basic tutorials for their respective disciplines in a way that promises to engage and interest engineers from other fields. These tutorials are ideal for learning the fundamentals and key components of specific disciplines within the field of turbo technology.

Ceramics and Ceramic Composites

107761 Environmental Barrier Coatings for Gas Turbine Applications
Michael Presby, NASA, United States

107761 Environmental Barrier Coatings for Gas Turbine Applications
Michael Presby, NASA, United States

107774 Environmental Barrier Coating Processing and Challenges
Bryan Harder, NASA Glenn Research Center, United States

107774 Environmental Barrier Coating Processing and Challenges
Bryan Harder, NASA Glenn Research Center, United States

107833 A Review of the History of Sic/sic Ceramic Matrix Composite (Cmc) Development in the United States for Commercial Aircraft Engine Applications, With Emphasis on Events and Programs That Supported Increasing Trl to 5
Doug Kiser, NASA Glenn Research Center, United States

107852 Use of Acoustic Emission and Electrical Resistance to Assess Non-Oxide Cmc Damage Development And/or Defect Content
Gregory N. Morscher, University of Akron, United States

104161 Hydrogen for Power and Energy Storage
Brain Connolly, Southwest Research Institute, United States

106602 Life Cycle Assessment Basics and Application to Optimize the Environmental Sustainability of Gas Turbines During New Product Development
Angela Serra, Baker Hughes, Italy

Coal, Biomass, Hydrogen & Alternative Fuels

106713 Design of Fuel Cells-Based Power & Propulsion Systems for Different Applications: Automotive, Aircraft, Power Generation
Clement Joly, Softinway, Inc, United States

108283 Challenges of Combustion Computational Fluid Dynamics [Ccfd] for the Design and Analysis of Low Emissions Industrial Gas Turbine Engines
Pierre Gauthier, Siemens, Canada

105391 Combustion Fundamentals
Mike Klassen, Combustion Science and Engineering, United States

Combustion, Fuels & Emissions

105392 Tutorial of Basics: Combustion Dynamics
Jacqueline O'Connor, Pennsylvania state university, United States

107258 Introduction to Data Assimilation, With Application to Thermoacoustics
Matthew Juniper, Cambridge university, United Kingdom

103106 Optical Diagnostics for Turbomachinery Applications
Tamara Guimaraes Bucalo, Penn State, United States

107900 Closed Thermodynamic Cycle Analysis and Optimization
Antonio Escamilla Perejã³N, Universidad de Sevilla, Spain

Cycle Innovations

107849 Hybrid Power and Storage Solution at Power Plant Scale
Alessandro Sorce, University of Genoa, Italy

107849 Hybrid Power and Storage Solution at Power Plant Scale
Alessandro Sorce, University of Genoa, Italy

107900 Closed Thermodynamic Cycle Analysis and Optimization
Owen Pryor, Southwest Research Institute, United States

Electric Power

106067 "Numbers to Live By" or the Physics Behind the Energy Transition
Alessandro Ramaglia, Ansaldo Energia, Italy

107655 Hydrogen Impacts 101: Are You Asking the Right Questions?
Christopher Perullo, Turbine Logic, United States

107817 Leveraging Operational Gas Turbine Data at Scale: Tips and Techniques
Steven Koskey, Turbine Logic, United States

107749 Introduction to ASME Ptc 53: Performance Test Code for Mechanical and Thermal Energy Storage Systems
William Conlon, Pintail Power, United States

Fans and Blowers

107863 Normalization and Preprocessing of Cfd Data for Machine Learning Algorithms
David Sánchez Martínez, University of Seville, Spain

Energy Storage

107886 Overview of Long-Duration Energy Storage Systems and Technologies: Part 1
Timothy Allison, Southwest Research Institute (SwRI), United States

107889 Overview of Long-Duration Energy Storage Systems and Technologies: Part 2
Timothy Allison, Southwest Research Institute (SwRI), United States

Fans and Blowers

107863 Normalization and Preprocessing of Cfd Data for Machine Learning Algorithms
Giovanni Delibra, Sapienza University of Rome, Italy

Heat Transfer: Tutorials

106798 Internal Cooling of Turbine Blades and Vanes: A Review and Application of Advanced Cooling Technology
Lesley Wright, Texas A&M University, United States

106798 Internal Cooling of Turbine Blades and Vanes: A Review and Application of Advanced Cooling Technology
Lesley Wright, Texas A&M University, United States

106798 Internal Cooling of Turbine Blades and Vanes: A Review and Application of Advanced Cooling Technology
Lesley Wright, Texas A&M University, United States

Industrial & Cogeneration

107332 Combustion and Emissions Tutorial
Manfred Klein, Environment Canada, Canada

107670 Radial Turbines: Thermal Effects, Off-Design Operation, Pulsating Flow and Acoustics
Manfred Klein, Environment Canada, Canada

Manufacturing Materials & Metallurgy

107211 Ecological Assessment and Sustainable Productivity for Aircraft Engine Machining
Kilian Fricke, Fraunhofer Institute for Production Technology, Germany

107255 Component Degradation and Damage Mechanisms in Industrial Gas Turbines
William Day, PSM, United States

107438 Metallurgy for the Non-Metallurgist
Paul Lowden, Liburdi, Canada

Microturbines, Turbochargers & Small Turbomachines

107891 The Surge Greitzer Model
Grzegorz Liskiewicz, Łódź University of Technology, Poland

Oil & Gas Applications

100499 Oil and Gas Applications for Turbomachinery
Rainer Kurz, Solar Turbines, United States

100499 Oil and Gas Applications for Turbomachinery
Rainer Kurz, Solar Turbines, United States

106905 Decarbonization: Oil and Gas Compressor Applications for Hydrogen and CO_2
Rainer Kurz, Solar Turbines, United States

108360 Gas Turbines for Lng Production Processes Tutorial
Manfred Klein, Environment Canada, Canada

107765 Introduction to Steam Turbine Performance Testing
Tao Guo, GE Power, United States

107845 Complexities in Creep-Fatigue Lifetime Assessment - Past, Current & Future Needs
Christian Kontermann, Darmstadt University, Germany

Structures and Dynamics: Bearing & Seal Dynamics

107924 A Review of Active Magnetic Bearing Technology: Past, Present, and Future
Rasish Khatri, Calnetix, United States

102560 How to Apply Api Standards to Turbomachinery Rotordynamics – an Introduction
Clement Joly, Softinway, Inc, United States

107882 Torsional Vibration: State-of-the-Art in Modeling, Measurement and Model-Based Monitoring for Power Generation and Mechanical Drive Applications
Mateusz Golebiowski, GE Gas Power, Switzerland

Supercritical CO_2

107887 Heat Exchangers for Supercritical CO_2 Power Cycle Applications
Michael Marshall, Southwest Research Institute, United States

107887 Heat Exchangers for Supercritical CO_2 Power Cycle Applications
Michael Marshall, Southwest Research Institute, United States

107903 Materials for Supercritical Carbon Dioxide Applications
Henry Saari, Carleton University, Canada

107908 Turbomachinery Design and Operation for Supercritical CO_2 Applications
Timothy Allison, Southwest Research Institute (SwRI), United States

108271 Everything You Always Wanted to Know About SCO_2 Compression but Were Afraid to Ask
Martina Ricci, Baker Hughes, Italy

Turbomachinery: Tutorials

100900 Turbomachinery Cfd With Openfoam
Jeffrey Defoe, University of Windsor, Canada

106714 Reduced Order Modelling Approach for Turbomachinery Secondary Flow Systems
Clement Joly, Softinway, Inc, United States

107799 Adjoint-Based Turbomachinery Shape Optimization: Basic Concepts, Challenges and Applications
Matteo Pini, Propulsion & Power, Delft University of Technology, Netherlands

Wind Energy

107881 Modern Vertical-Axis Wind Turbines: Design Optimization, System Modelling, Performance Analysis, and Future Trends
Taha Sherif, Faculty of Engineering - Menoufia University, Egypt

109113 Introduction to Offshore Wind Development
Ramy Imam, Ramy Imam, Egypt

2023 TURBO EXPO

Technical Program

Personalize your conference experience.

This year's technical program is available on the TE23 Turbo Expo App and website. It is no longer available in PDF format. The new digital format will provide you with real time changes and the power to tailor the conference to your needs.

THE APP WILL ALLOW YOU TO:

SEARCH OR FILTER SCHEDULE BY

- Paper Number
- Session Number
- Author
- Presentation Type
- Track
- Date & Time
- Session Organizer

BUILD YOUR OWN SCHEDULE BY

- Sessions
- Individual Presentations
- Networking Sessions
- Committee Meetings
- Booking the private boardroom

HAVE YOUR SAY

- Participate in Q & A
- Answer Poll Questions
- Report AV Issues
- Provide conference feedback

CONNECT WITH YOUR PEERS

- Access the attendee list
- See who is in conversation
- Find attendees with commonalities
- Build your network

BE IN THE KNOW

- Up to date schedule modifications
- Show announcements
- Access to all speaker bios

Download the Turbo Expo App Now!

The Turbo Expo App includes information on Technical Papers, Authors, the Schedule, Speakers, Awards, & more.

ANDROID

IOS

Still have a question? Visit the Info Desk near Registration (Floor 2).

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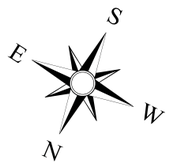
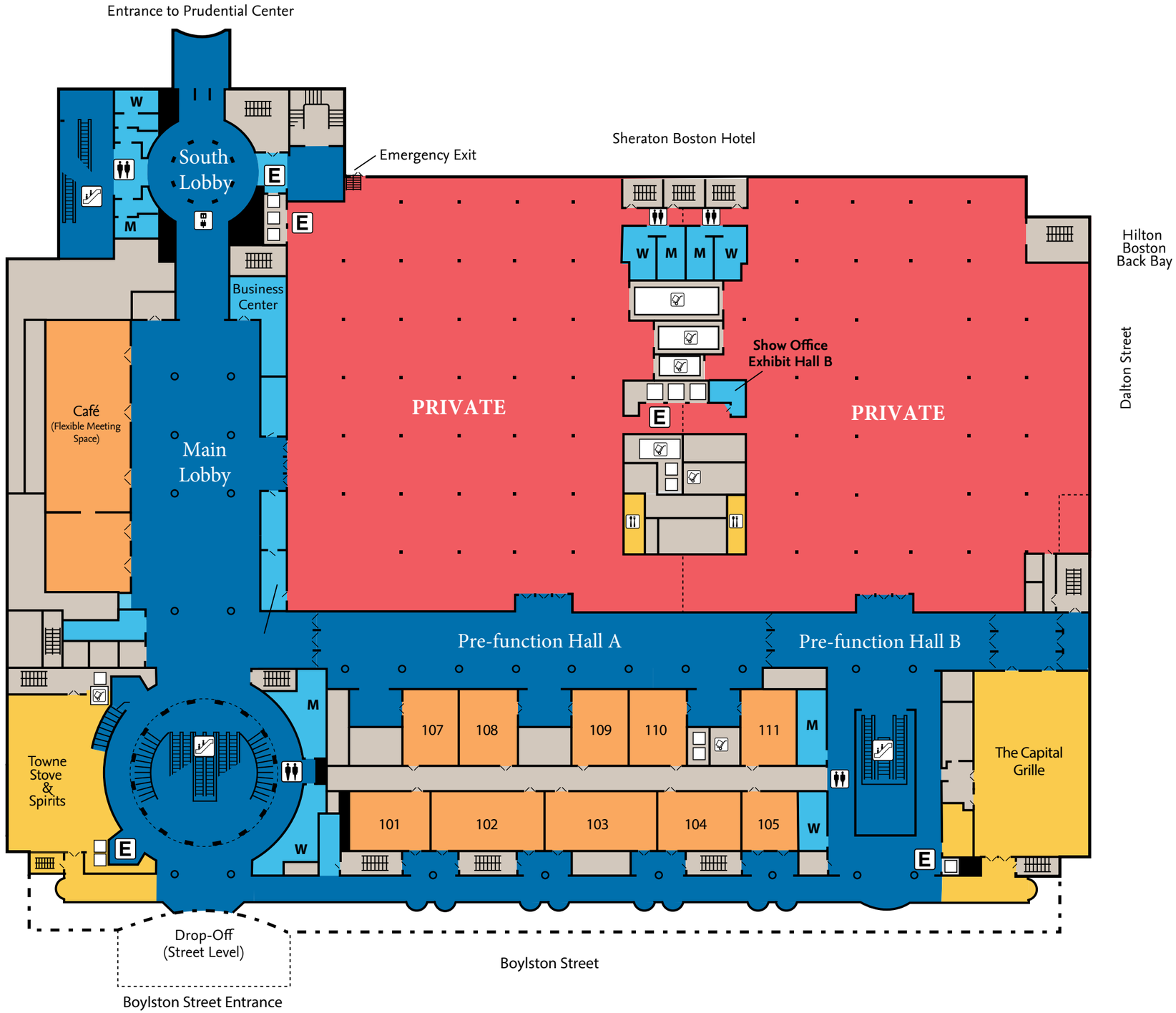
Plaza Level





- **Exhibit Space**
- **Meeting Rooms**
- **Ballroom**
- **Lobby & Pre-function**
- Public Use
- Ring Road
- Non-Public Access
- Loading Dock Pre-Feb Area & Loading Dock Covered Truck Access
- Food Services
- Elevator
- Freight
- Escalator
- Restrooms
- Permanent Concessions
- Charging Stations
- Stairs

MASSACHUSETTS CONVENTION CENTER AUTHORITY
The Massachusetts Convention Center Authority owns and operates the Boston Convention & Exhibition Center, the John B. Hynes Veterans Memorial Convention Center, and The Lawn On D.

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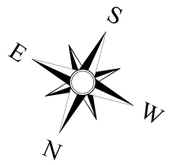
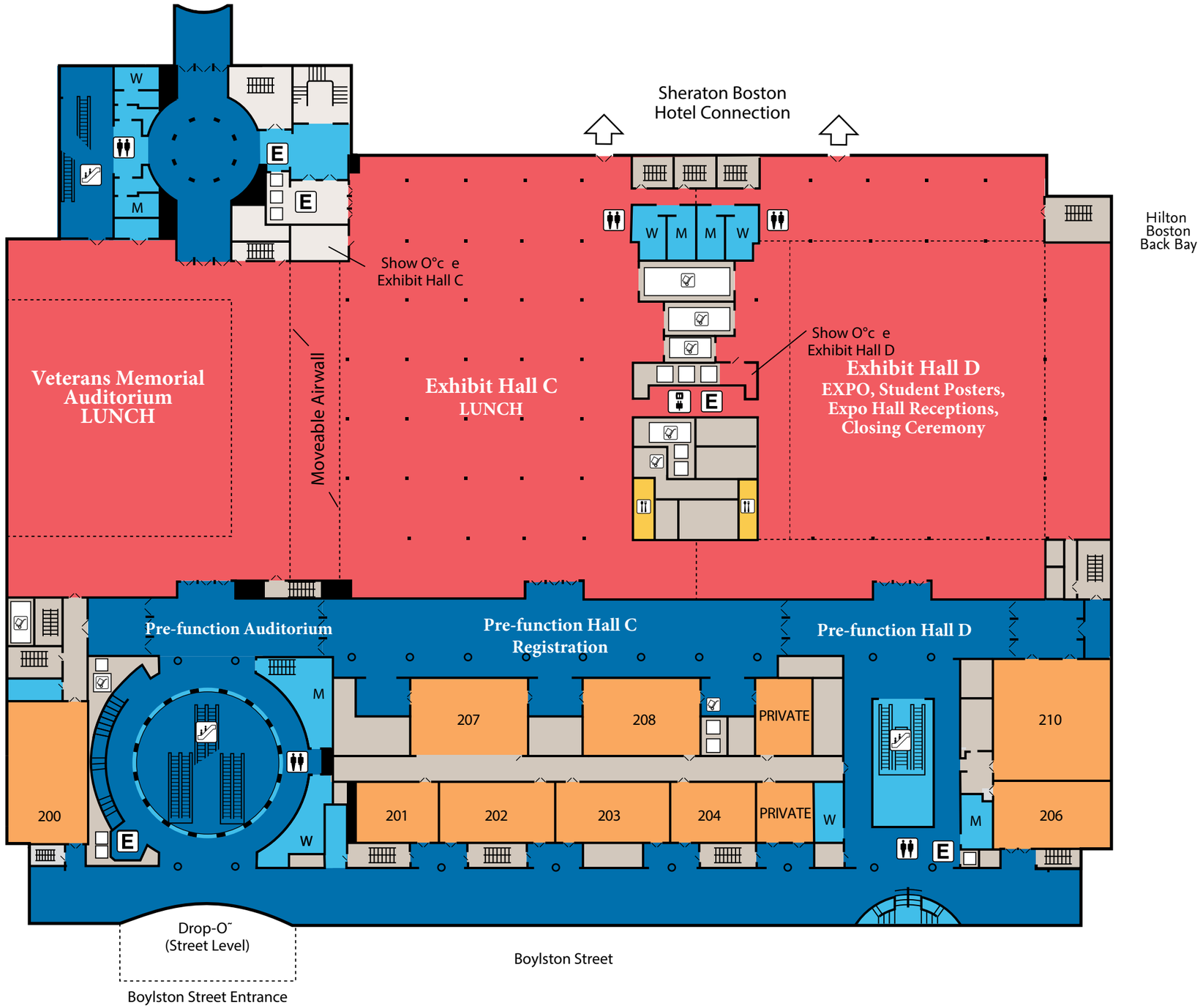
Second Level





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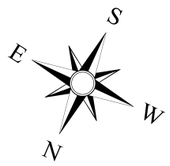
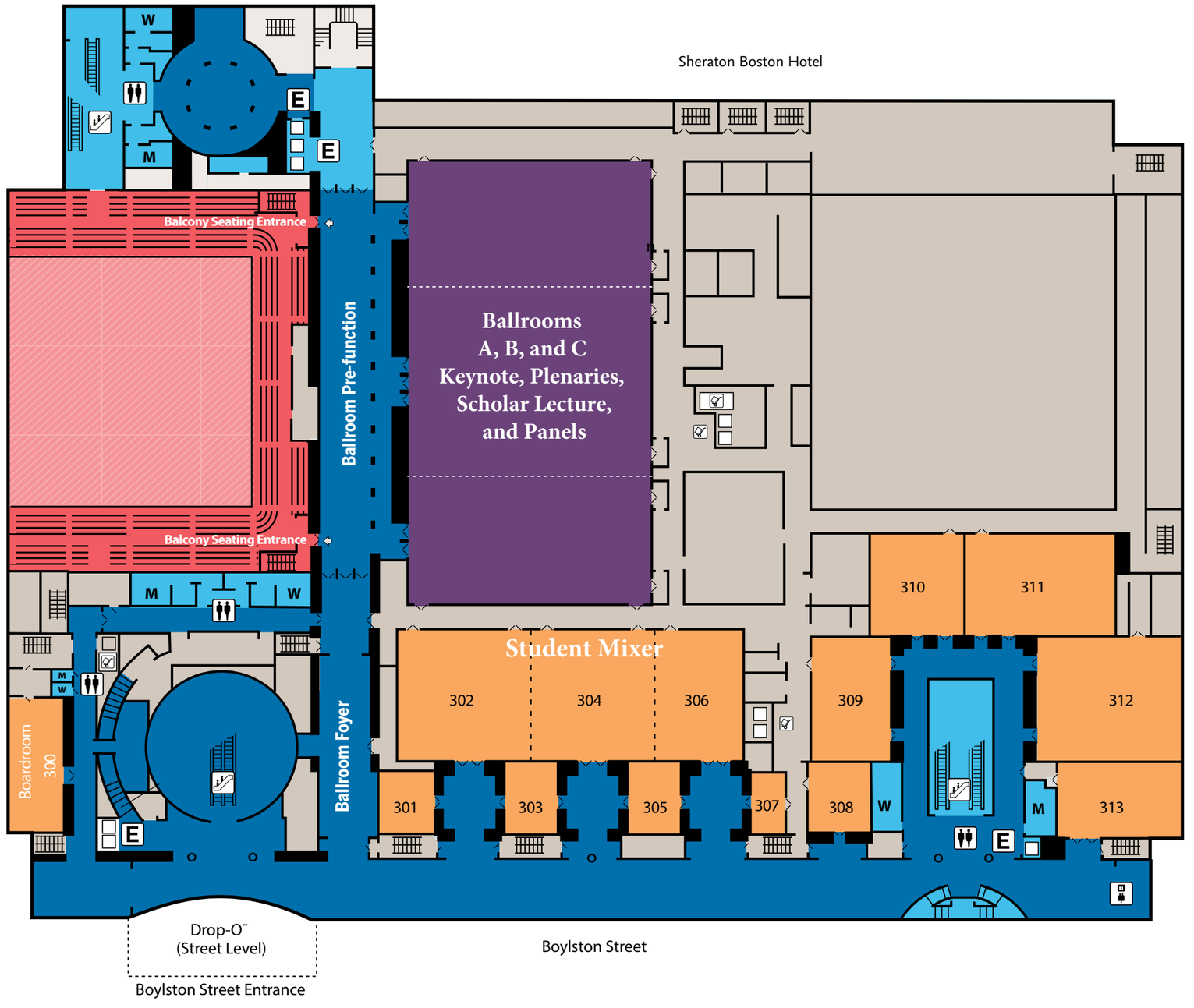
Third Level





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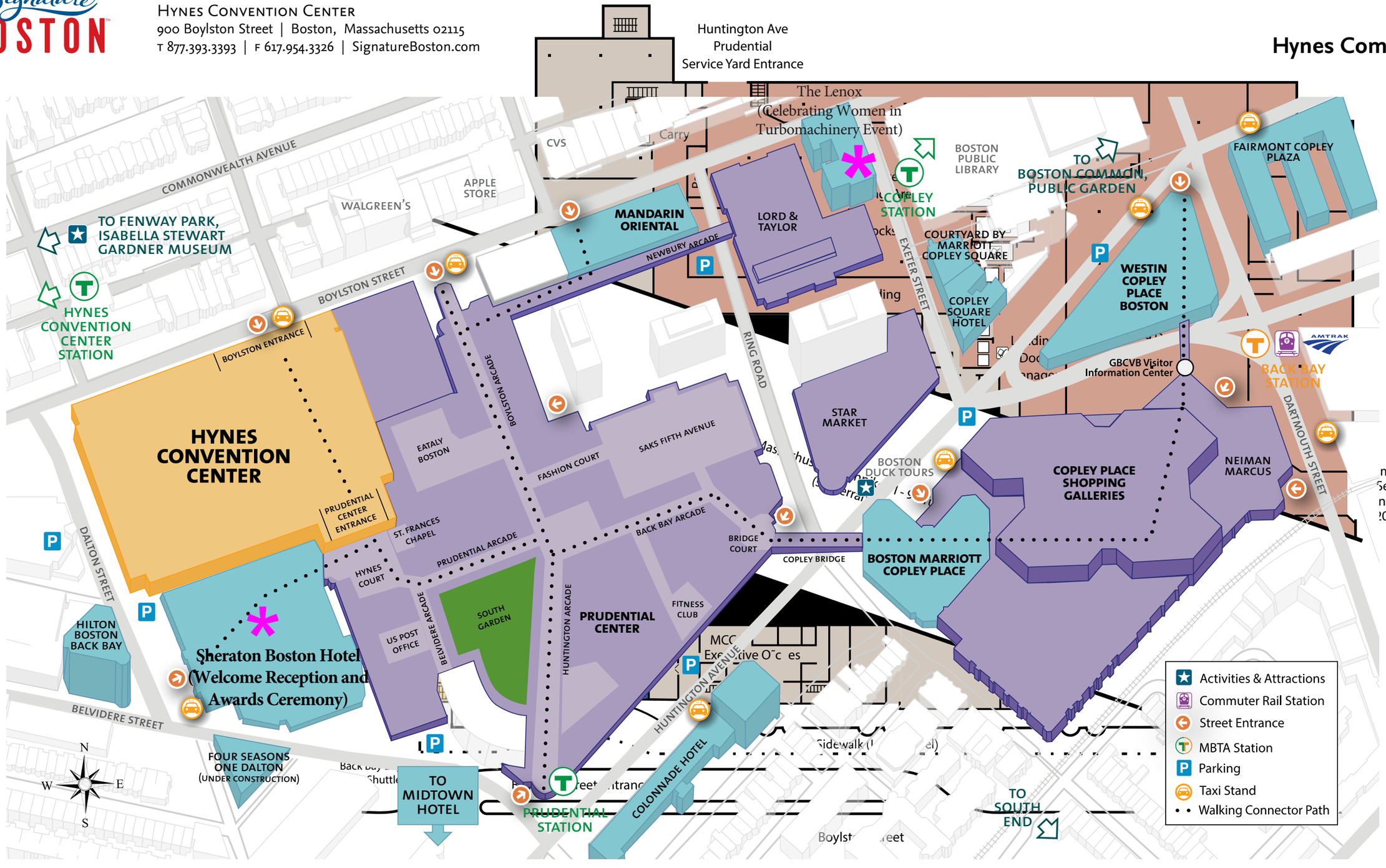
Hynes Complex



MASSACHUSETTS CONVENTION CENTER AUTHORITY

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Schedule at a Glance

SUNDAY June 25	MONDAY June 26	TUESDAY June 27	WEDNESDAY June 28	THURSDAY June 29	FRIDAY June 30
	Registration 7:00 am - 5:30 pm	**Registration** 7:00 am - 6:30 pm	**Registration** 7:00 am - 6:30 pm	**Registration** 7:00 am - 5:30 pm	**Registration** 7:00 am - 12:00 pm
	Speaker Ready Room 7:00 am - 5:30 pm	**Speaker Ready Room** 7:00 am - 5:30 pm	**Speaker Ready Room** 7:00 am - 5:30 pm	**Speaker Ready Room** 7:00 am - 5:30 pm	**Speaker Ready Room** 7:00 am - 12:00 pm
	Open Meeting Room 7:00 am - 7:30 pm	**Open Meeting Room** 7:00 am - 7:30 pm	**Open Meeting Room** 7:00 am - 7:30 pm	**Open Meeting Room** 7:00 am - 7:30 pm	
Gas Turbine Technology Group Meeting 1:00 pm - 5:00 pm	**Conference Sessions** 8:00 am - 10:00 am	**Conference Sessions** 8:00 am - 10:00 am	**Conference Sessions** 8:00 am - 10:00 am	**Conference Sessions** 8:00 am - 10:00 am	**Conference Sessions** 8:00 am - 10:00 am
	Networking Coffee Break 10:00 am - 10:30 am (Conference Hall)	**Networking Coffee Break** 10:00 am - 10:30 am (Conference Hall)	**Networking Coffee Break** 10:00 am - 10:30 am (Conference Hall)	**Networking Coffee Break** 10:00 am - 10:30 am (Exhibit Hall)	**Networking Coffee Break** 10:00 am - 10:30 am (Conference Hall)
	Opening Ceremony & Keynote 10:30 am - 12:00 pm	**Plenary Session** 10:30 am – 12:00 pm	**Plenary Session** 10:30 am – 12:00 pm	**Conference Sessions** 10:30 am - 12:00 pm	**Conference Sessions** 10:30 am – 12:00 pm
	Opening Lunch 12:00 pm – 1:30 pm (Auditorium Entrance)	**Expo Open** 12:00 pm – 6:30 pm **Networking Lunch** 12:00 pm – 1:30 pm (Exhibition Hall) **Poster Session** 12:00 pm – 1:30 pm	**Expo Open** 12:00 pm – 6:30 pm **Networking Lunch** 12:00 pm – 1:30 pm (Exhibition Hall)	**Expo Open** 10:00 am – 2:30 pm ***Final* Networking Lunch** 12:00 pm – 1:30 pm (Exhibition Hall) **Closing Ceremony** 1:00 pm – 2:15 pm	**Conference Close** 12:00 pm
Registration 3:00 pm - 6:00 pm	**Conference Sessions** 1:30 pm – 3:30 pm	**Conference Sessions** 1:30 pm – 3:30 pm	**Conference Sessions** 1:30 pm – 3:30 pm	**Conference Sessions** 1:30 pm – 3:30 pm	**IGTI Committee Meeting** 1:00 pm – 5:30 pm
Speaker Ready Room 3:00 pm - 6:00 pm	**Networking Coffee Break** 3:30 pm - 4:00 pm (Conference Hall)	**Networking Coffee Break** 3:30 pm - 4:00 pm (Exhibit Hall)	**Networking Coffee Break** 3:30 pm - 4:00 pm (Exhibit Hall)	**Networking Coffee Break** 3:30 pm - 4:00 pm (Conference Hall)	
	Conference Sessions 4:00 pm – 5:30 pm	**Conference Sessions** 4:00 pm – 5:30 pm	**Conference Sessions** 4:00 pm – 5:30 pm	**Conference Sessions** 4:00 pm – 5:30 pm	
Council of Chairs Meeting 6:00 pm - 7:30 pm	**Scholar Lecture** 5:45 pm - 7:00 pm	**Expo Hall Networking Reception** 5:00 pm - 6:30 pm	**Expo Hall Networking Reception** 5:00 pm - 6:30 pm		
		Technical Committee Meetings 6:00 pm - 7:30 pm	**Technical Committee Meetings** 6:00 pm - 7:30 pm	**Technical Committee Meetings** 6:00 pm - 7:30 pm	
Early Career & Student Networking Mixer 7:30 pm - 9:30 pm (Room 304)	**Welcome Reception & ASME/IGTI Awards** 7:00 pm - 8:30 pm (Boston Sheraton)		**Celebrating Women in Turbomachinery Event/ Dinner** 7:45 pm - 10:00 pm (Lenox Hotel)		

REGISTRATION | CONFERENCE SESSIONS | COFFEE BREAKS | LUNCH & EXHIBIT

MEETINGS | SPEAKER READY ROOM | NETWORKING | SPECIAL SESSIONS

SCHEDULE SUBJECT TO CHANGE. UPDATED APRIL 20, 2023.