ASME 2018 Turbo Expo

FINAL PROGRAM

June 11 - 15, 2018 | Lillestrøm, Norway

American Society of Mechanical Engineers (ASME)

ASME SETTING THE STANDARD

ASME INTERNATIONAL GAS TURBINE INSTITUTE

NUMECA INTERNATIONAL

Boost your performance in Design - Analysis - Optimization

OMNIS™ Platform - Integrated environment for multidisciplinary simulation and optimization

NEW: Lattice Boltzmann ánd **Navier Stokes** in one environment

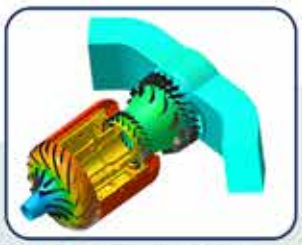
Turbo-machinery

Multiphysics & External Aero

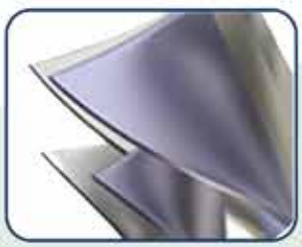
Meshing

Marine

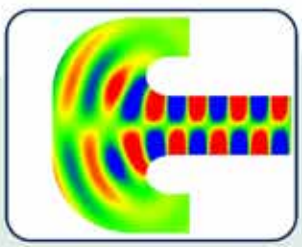
From preliminary, meanline design to detailed 3D steady & unsteady CFD



Full engine simulation with NLH



Robust Design Optimization with Uncertainty Quantification



Fully coupled aero-vibro-acoustics suite with wizard-based automation

Visit us at **stand #300-302**

FREE Lunch & Learn session Tuesday June 12th

FREE Workshops Wednesday June 13th (*)

(*) Check your conference program for exact location and timing

NUMECA

Advanced developments for better products

Table of Contents

Welcome to Turbo Expo

We hope you will enjoy your visit to Lillestrøm/Oslo!

Please join us at the Grand Opening Session on Monday morning which includes the Turbo Expo Keynote Panel and ASME IGTI Awards Ceremony. This year's keynote theme is "Maintenance, Repair and Overhaul in the light of Digitalization." The keynote panel format, with moderators fielding questions from the audience and posing them to the panelists, was introduced in 2016. Offering their expert perspectives will be keynote speaker Dr. Zuo Zhi Zhao, CTO Siemens Power and Gas, and Russel Irving, Digital Twin General Manager & Chief Engineer GE Global Research. The keynote panelists will be Frode Abotnes, Vice President of Technical Multifield Center Equinor (former Statoil), Pascal Decoussemaeker, Senior Product Manager GE Power Switzerland and European Turbine Network Asset Management Chair and Shawn Gregg, General Manager Propulsion Engineering, Delta Air Lines. The session will be moderated by Elisabet Syverud, Packaging Product Manager Dresser-Rand a Siemens Business and by myself, Damian Vogt, Professor University of Stuttgart. Two plenary sessions will follow a similar format on Tuesday and Wednesday morning (see page 10 for more information).

The awards ceremony will honor the winners of the ASME R. Tom Sawyer Award, the ASME Gas Turbine Award, the 2017 and 2018 ASME Dedicated Service Awards, the ASME IGTI Industrial Gas Turbine Technology and Aircraft Engine Technology Awards, the John P. Davis Award, and the Early Career Engineer Award in memory of the late Dilip R. Ballal.

As one of an estimated 3,000 participants, you will have a choice of over 1,000 technical papers to be presented in over 400 technical sessions. This year's schedule has specifically been composed having not only your seamless thematic attendance of sessions and tracks in mind but also your networking experience; there is no other event that brings together as many experienced and new experts from the various field of turbomachinery from around the world as the Turbo Expo does and we truly hope that you will be able to interact with existing contacts while making new ones. As one of the novelties of this year's Turbo Expo, three distinct focus tracks will shed light on high-potential areas within the framework of the existing technical committees: Maintenance, Repair and Overhaul in the light of Digitalization (short MRO/Digital), Additive Manufacturing (AM) and Pressure Gain Combustion (PGC). These focus tracks feature Plenary Sessions (MRO/Digital and AM only), dedicated Technical Sessions as well as Panel and Tutorial Sessions given by renowned experts in the respective fields (see page Y for more information). The exposition will showcase the newest products from almost 100 companies, offering opportunities for practitioners and researchers to come together. Furthermore, there will be panel sessions and tutorials. The tutorials have undergone a new selection and review process with the aim to ensure high quality and optimum learning outcome. All Turbo Expo attendees are kindly invited to the Welcome Reception on Monday evening. The Women in Engineering Networking Event is on Tuesday evening and students and young engineers should not miss the mixer on Wednesday evening.

On behalf of ASME IGTI, I wish to thank our sponsors who have ensured the success of Turbo Expo 2018 through their generous support. I also wish to thank our Executive Conference Chair, Elisabet Syverud, the keynote and plenary panelists, our Local Liaison Committee Chair, Stein Jørgensen, this year's Review Chair, Patricia Cargill and the Vice Review Chairs, Dilip Prasad, Graham Pullan, Zolti Spakovszky and our Technical Program Chair, Jeff Green. Special thanks to all of the volunteers who contributed to make Turbo Expo the premier conference for turbomachinery technology. Turbo Expo would not be possible without the tireless efforts of the authors, reviewers, session organizers, point contacts, vanguard chairs, committee leaders, and others. Thank you for attending Turbo Expo. I hope that you find your time in Lillestrøm/Oslo to be an enriching and memorable experience.

Prof. Damian Vogt
Conference Chair
University of Stuttgart

Grand Opening

Welcome to Oslo

Velkommen til Norge og Oslo! Welcome to Norway and Oslo!

At this very place in 1903, the Norwegian engineer Ægidius Elling successfully built and operated the world's first gas turbine producing net power. Elling was born in and grew up in Oslo (at that time called Kristiania), studied mechanical engineering at Kristiania Technical College and had his invention of a gas turbine patented in 1884 when he was only 23 years old. He continued to work on his gas turbine until 1932 raising the power output considerably. Being a true visionary, Elling stated in 1933: "When I started to work on the gas turbine in 1882 it was for the sake of aeronautics and I firmly believe that aeronautics is still waiting for the gas turbine". Elling was much ahead of his time and therefore was not able to witness the success of his own invention.

Interesting enough, another innovative Norwegian studied at the same time as Elling at the Kristiania Technical College, but only for a limited time: Edvard Munch, today most famous for his painting "The Scream". Munch abandoned after one year his engineering training and instead joined the Royal School of Art and Design in Kristiania to follow his life's devotion: painting. The National Gallery in Oslo has one painted version of "The Scream" on display while the Munch Museum holds the other painted version.

Oslo offers several attractive sights such as the Opera House, the Akershus Fortress, the Royal Palace, the Viking Ship Museum and the Holmenkollen Ski Arena to name a few. Talking about skiing, Norway has successfully been showing the way for several centuries and is regularly outperforming any other country at the Winter Olympics. Today's Norway is among others showing the way in eco-friendliness: 98.5% of the electricity is produced from renewables (to a large degree hydro power) and the share of electrical cars is by far greater than in any other country of the world.

When it comes to gas turbines, Norway features the highest density of such machines due to the intensive exploration of off-shore oil and gas sites in the North Sea. On the industry tours offered during the Turbo Expo, you will have the possibility to learn more about the challenges and the developments of high-performance machinery operating in ultra-harsh environments calling for ingenuous solutions.

We wish you a fruitful and inspiring Turbo Expo and hope that you will have the time to enjoy Oslo while exploring the Norwegian spirit.

Dr. Elisabet Syverud
Executive Conference Chair
Dresser-Rand A Siemens Busines

Opera House

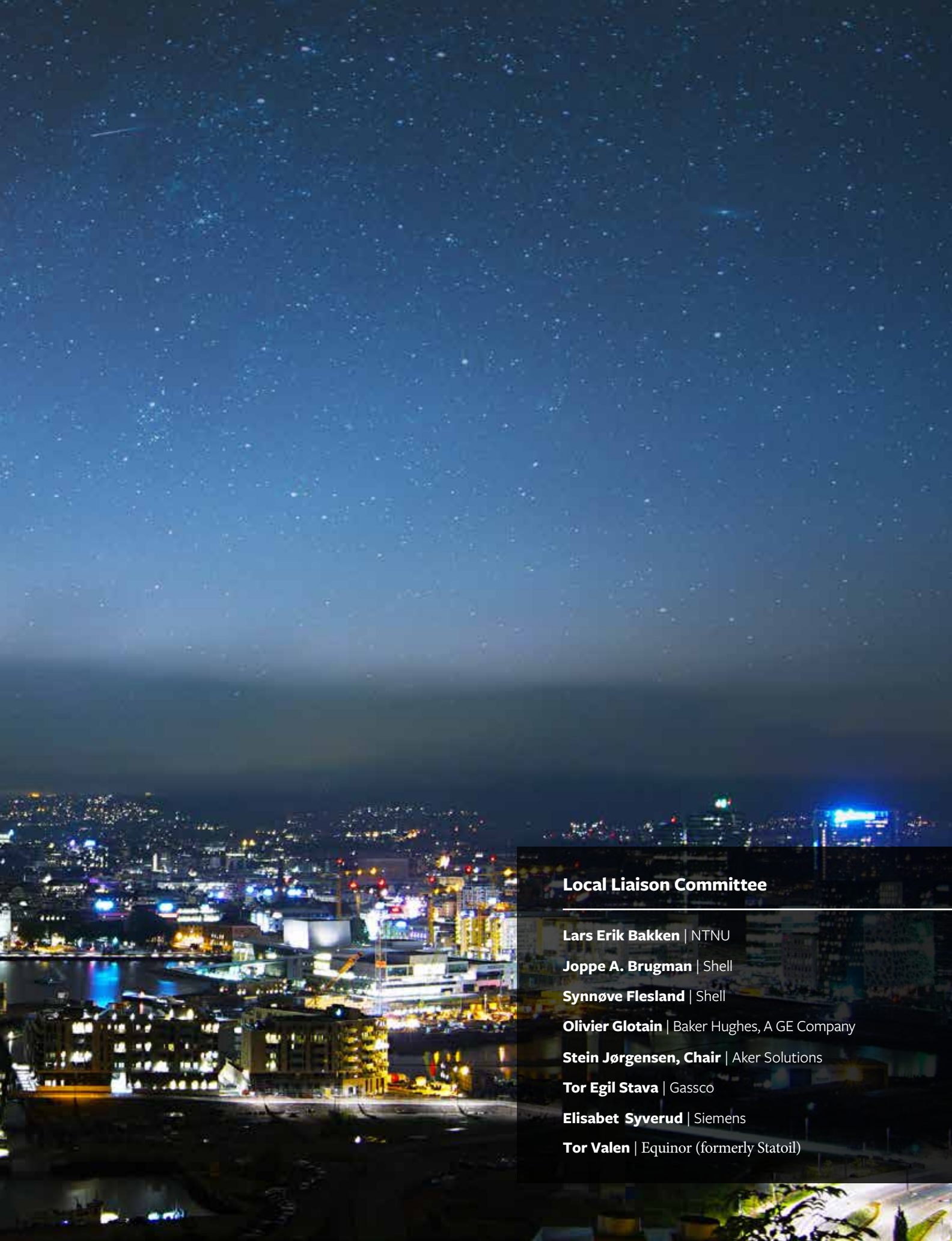
Akershus Fortress

Royal Palace

Welcome to Lillestrøm (Oslo), Norway

Lillestrøm is a town located east-northeast of Oslo, the capital city of Norway. Oslo is the most popular city in Norway and is the economic and governmental centre of Norway. It was ranked number one among European large cities in terms of quality of life.

Norway is arguably one of the most beautiful countries on earth. It's famous for its natural attractions like Fjords, mountains and midnight sun, but it's also well known for a vibrant cultural life. The culture of Norway is closely linked to the country's history and geography. The city of Oslo has a wide variety of cultural institutions and a nice selection of restaurants, some world class. Many of the best things are free of charge, notably Oslo's proximity to wild nature and variety of outdoor activities.



Local Liaison Committee

Lars Erik Bakken | NTNU

Joppe A. Brugman | Shell

Synnøve Flesland | Shell

Olivier Glotain | Baker Hughes, A GE Company

Stein Jørgensen, Chair | Aker Solutions

Tor Egil Stava | Gassco

Elisabet Syverud | Siemens

Tor Valen | Equinor (formerly Statoil)

Thank You Sponsors!

Platinum

Rolls-Royce

Silver

ANSYS

Pratt & Whitney
A United Technologies Company

Women in Engineering

Bronze

NUMECA INTERNATIONAL

Attendee Bags

Solar Turbines
A Caterpillar Company

SIEMENS
Ingenuity for life

NASA

Additional Sponsors

Women in Engineering

Concepts NREC
The Experts in Turbomachinery

Name Badge Insert

Altair

Lanyards

Supporting Publications & Participating Organizations

COMPRESSOR tech²
Dedicated To Gas Compression Products & Applications

Diesel & Gas Turbine WORLDWIDE
engine systems technology for marine, stationary power, oil & gas and rail since 1969

mechanical engineering

GTSJ

Turbomachinery INTERNATIONAL

TURBINES & DIESELS

ETN Global

CAMBRIDGE FLOW SOLUTIONS
Proprietary and customised CFD

BOXERMesh
V3.8.3

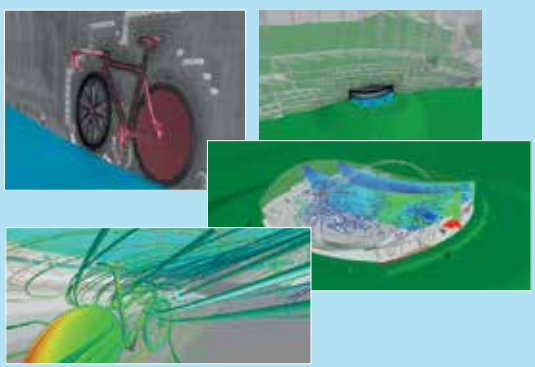
- Cambridge Flow Solutions conducts strategic, long-term research with Development Partners. Our work is focussed on BOXER – a fully scalable simulation environment coupling an advanced Digital Geometry model, mesh generation and CFD – aimed at complex, real-world, conjugate applications.
- We are pleased to be able to offer a product of that research: BOXERMesh v3.8.3

The Scalable Parallel Meshing Solution for GigaCell Simulations

- Fully automatic, parallel scalable, highly suitable for GigaCell meshes
- Automatic viscous layer extrusion
- Complex, multi-source CAD collected into a single domain
- Digital (voxel) geometry representation
- No CAD clean-up required
- Rapid, robust meshing at huge range of length scales
- Solver quality aware meshing metrics
- Wide range of CAD formats supported
- Wide range of solver formats supported
- Suitable for laptop, desktop, local cluster, supercomputer and cloud platforms

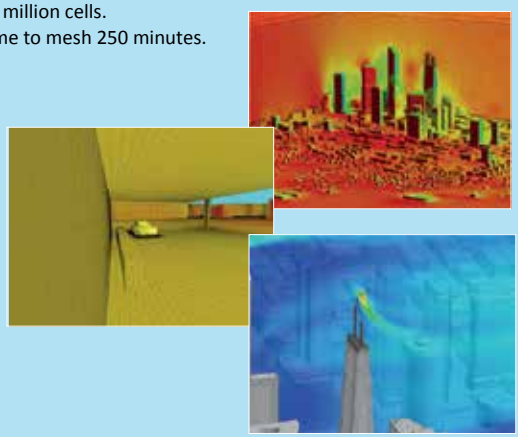
Bicycle in velodrome in landscape example

Mesh cell sizes range from 1mm to 100 metres.
100 million cells. Time to mesh 300 minutes.



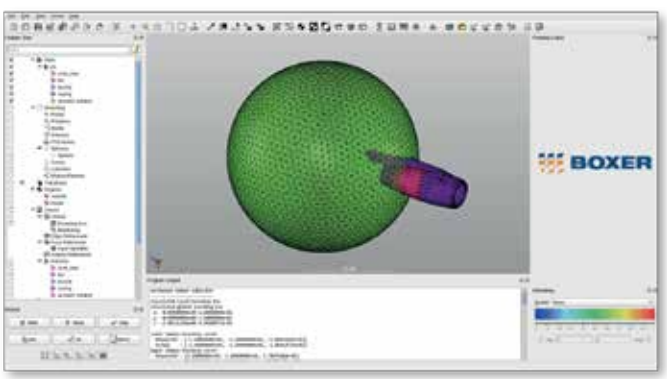
Helicopter and car in cityscape example

84 million cells.
Time to mesh 250 minutes.



NEW in v3.8.3 Geometry Primitives

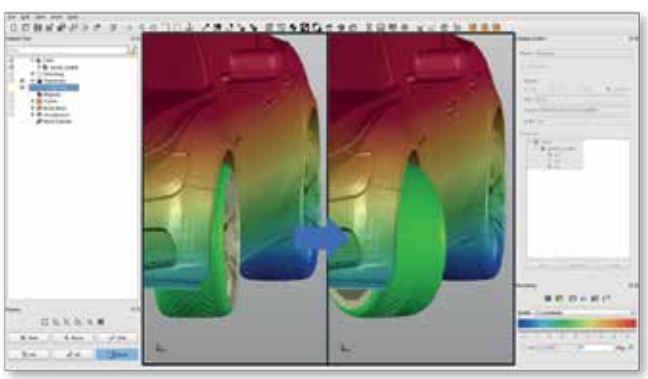
Create cubes, spheres, cones and cylinders to augment imported CAD or build simple models from scratch



Create a sphere to act as an acoustic propagation surface for jet exhaust noise prediction

NEW in v3.8.3 In-built geometry transform tools

Transform any collection of patches, parts or facets to model mechanism motion, deformation under load etc



Change car steering angle and ride height for cornering analysis

Keynote and Awards Program

Maintenance, Repair and Overhaul in the Light of Digitalization

Turbo Expo Keynote & ASME IGTI Annual Awards

Monday June 11, 2018, 10:15 a.m. – 12:15 p.m.
Hall B4, Norway Exhibition and Convention Centre

Join the best and brightest experts from around the world at the 2018 must-attend event bringing together business leaders, technology experts and authorities in the field of turbomachinery. It is an ideal opportunity to network, learn about the latest trends and open new chapters in turbomachinery.

Targeted Maintenance, Repair and Overhaul (MRO) at the right time is key to ensuring efficient, reliable and affordable operation of turbomachines throughout their lifetime. Digitalization thereby provides unprecedented opportunities to define targeted MRO measures, learn valuable lessons from digital twins and optimize processes. In other words, digitalization is about to revolutionize the way of designing, manufacturing, operating and servicing turbomachines. But which are the challenges and opportunities that OEMs are facing in this respect? And how do operators deal with these new trends? What are the views of insurers and certification institutes on this? To learn about these aspects, join your peers and attend the ASME Turbo Expo 2018 Keynote Session on Maintenance, Repair and Overhaul in the Light of Digitalization. Two prominent experts from OEMs, Dr. Zuo Zhi Zhao, CTO Siemens Power and Gas, and Russel Irving, Digital Twin General Manager & Chief Engineer GE Global Research, will share their views on this thrilling subject and discuss it with a panel of specialists from the airline industry, oil & gas industry and the MRO sector.

KEYNOTE SPEAKERS AND PANELISTS

Zuo Zhi Zhao
- Speaker -
Chief Technology Officer
Power & Gas division,
Siemens Power and Gas

Russel Irving
-Speaker-
Digital Twin General Manager & Chief Engineer
GE Global Research

Pascal Decoussemaeker
- Panelist -
Senior Product Manager
GE Power in Switzerland

Frode Abotnes
- Panelist -
Vice President of Technical Multifield Center
Equinor (former Statoil)

Shawn Gregg
- Panelist -
General Manager, Propulsion Engineering
Delta Air Lines

PLENARIES

Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts

Tuesday, June 12, 2018 | 10:15 – 11:10 a.m.
Hall B4, Norway Exhibition and Convention Centre

Masahito Kataoka
Mitsubishi-Hitachi Power Systems

Markus Seibold
Siemens Power & Gas

Michael Winter
Pratt & Whitney

Henry Bernstein
Gas Turbine Materials Associate

The MRO Digital/Data Transformation

Wednesday, June 13, 2018 | 10:15 – 11:10 a.m.
Hall B4, Norway Exhibition and Convention Centre

Jeffrey A. Benoit
PSM Ansaldo Energia Group

Shawn Gregg
- Moderator -
Delta Airlines

Bernhard Krüger-Sprengel
Lufthansa Technik

Turbo Expo 2018 Leadership

Jaroslaw Szwedowicz
Segment Leader
Siemens Power and Gas

Richard Dennis
Segment Vice-Leader
National Energy Technology Laboratory

Ruben Del Rosario
Advisor
NASA

Paul Garbett
Member
Siemens Power & Gas

Eisaku Ito
Member
MHI

Anestis Kalfas
Member
Aristotle University of Thessaloniki

Tim Lieuwen
Advisor
Georgia Institute of Technology

Nicole Key
TEC Representative
Purdue University

James Maughan
Member
GE Power

Hany Moustapha
Member
École de Technologie Supérieure

Mark Turner
Member
University of Cincinnati

Gas Turbine Segment Leadership Team

Turbo Expo Organizing Commmittee

Damian Vogt
Conference Chair
University of Stuttgart

Elisabet Syverud
Executive Conference Chair
Dresser-Rand A Siemens Business

Jeff Green
Technical Program Chair
Rolls-Royce

Patricia Cargill
Review Chair
GE Aviation

Dilip Prasad
Vice Review Chair
Pratt & Whitney

Graham Pullan
Vice Review Chair
University of Cambridge

Zolti Spakovszky
Review Chair
Massachusetts Institute of Technology

Mark Turner
Gas Turbine Segment Liaison
University of Cincinnati

Gaylord Klammt
Exhibitor Representative
Präwest

Stein Jørgensen
Local Liaison Chair
Aker Solutions

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 reading committee in the recognition of important gas turbine technological achievements. Thank you to John Blanton for serving as the IGTI Honors and Awards Committee Chair, John Gülen as Industrial Gas Turbine Technology Award Committee Chair, and Keith Boyer as the Aircraft Engine Technology Award Committee Chair.

2018 ASME R. Tom Sawyer Award

Awarded to an individual who has made important contributions to advance the purpose of the gas turbine industry and the ASME International Gas Turbine Institute over a substantial period of time. The contribution may be in any area of Segment activity, but must be marked by sustained forthright efforts.

Dr. Aspi Wadia, GE Aviation

2016 ASME Gas Turbine Award

The Gas Turbine Award was established in 1963 to be given in recognition of an outstanding contribution to the literature of combustion gas turbines or gas turbines thermally combined with nuclear or steam power plants.

Dr. Svilen Svilenov Savov, TTP Plc
Dr. Nicholas Atkins, Whittle Laboratory
Dr. Sumiu Uchida, Mitsubishi Heavy Industries

2016 John P. Davis Award

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

Dr. Parthiv N. Shah, ATA Engineering Inc.
Gordon Pfeiffer, ATA Engineering Inc
Dr. Rory R. Davis, ATA Engineering Inc.
Thomas Hartley, Williams International
Dr. Zoltan Spakovszky, Massachusetts Institute of Technology

2018 Aircraft Engine Technology Award

For outstanding contribution to air breathing propulsion through inspiring leadership, education, and research having major impacts on aircraft engine operational capability, performance, and design.

Dr. Charles J. Cross, Air Force Research Laboratory

2018 Industrial Gas Turbine Technology Award

For outstanding contributions and industry leadership in low emissions combustion system research, design, development, and deployment.

Leroy O. Tomlinson, Retired GE

2018 Dilip R. Ballal Early Career Award

Awarded to an individual who has made significant contributions in the gas turbine industry within the first five years of their career.

Dr. Jacqueline O'Connor, Pennsylvania State University

ASME Dedicated Service Award

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

2017: Dr. Kenneth C. Hall, Duke University
2018: Dr. Sy A. Ali, Clean Energy Consulting

For more details on the award winners, please refer to the 2018 Awards Program. Programs will be available during the Grand Opening: Keynote and Awards Program on Monday, June 11.

Upcoming Award Opportunities

2018-2019 IGTI Student Scholarship

The deadline to submit an application is June 15, 2018. In the 2018-2019 school year up to 20 scholarships at $2,000 (USD) each will be awarded to qualifying students registered at an accredited university (either in the U.S. or elsewhere).

2019 Dilip R. Ballal Early Career Award

Nominations for the 2019 award are due to igtiawards@asme.org by August 1, 2018. The Early Career Award is intended to honor individuals who have outstanding accomplishments during the beginning of their careers. An early career award is intended for those starting a professional career, which is typically after a relevant terminal degree: BS, MS, or PhD. A criterion of seven years-from-degree will be used to define the nominee's eligibility. The nominee must receive the award prior to the completion of the seventh year beyond the terminal degree.

For more information on how to submit a nomination for an award, visit https://community.asme.org/international_gas_turbine_institute_igti/w/wiki/4029.honors-and-awards.aspx.

Networking Events

Welcome Reception

Monday, June 11 | 6:00 – 7:30 pm | West Entrance, Norway Convention Center
All Conference registrants are invited to join their colleagues for complimentary light refreshments during the Monday evening event. In a casual atmosphere, greet friends, and meet the thinkers from around the world who are shaping the future of turbomachinery.

Coffee Breaks

Day	Time	Location
Monday – Friday	10:00 – 10:15 am	Near the technical session rooms.
Monday	3:30 – 4:00 pm	Near the technical session rooms.
Tuesday – Thursday	3:30 – 4:00 pm	Exhibit Hall, Hall D

Daily Lunches

June 11 – 15
All Technical Conference delegate badges as well as exhibit booth staff badges include a daily lunch. Additional lunches for guests can be purchased onsite during registration. Take the time during lunch, Tuesday – Thursday, to walk the exhibit floor and visit the many exhibitors from around the world showcasing their products and services.

Expo Hall Receptions

Tuesday & Wednesday, June 12 & 13 | 5:00-6:30 p.m.
All registered delegates are invited to the Expo Hall for complimentary drinks and networking with industry colleagues, while viewing the exhibits of the industry's leading companies.

Early Career Engineer & Student Mixer

Wednesday, June 13 | 6:45 – 8:00 pm | West Entrance, Norway Convention Center
Unwind after a full day of technical sessions and exhibits with fellow engineering students and early career engineers. This popular event allows students to make new friends and build their professional network in a casual evening atmosphere. Complimentary refreshments will be provided.

Exposition Closing Ceremony

Thursday, June 14 Exhibit Hall D 1:30 – 2:15 pm
Please join us as we announce the "Peoples' Choice" booth display winners, the Student Poster winners, recognize outgoing committee chairs, the Young Engineer Travel Award recipients, and announce plans for Turbo Expo 2019 in Phoenix, Arizona USA!

Women in Engineering

Women in Engineering Networking Event | Tuesday, June 12 | 7:45 p.m. – 10:30 p.m.

Katherine A. Knapp Carney

Exec. Director – Mechanical Systems, Externals & Nacelles Engineering

Pratt & Whitney

Katherine Knapp Carney is originally from Rhode Island. She attended George Washington University in Washington, DC and graduated with a Bachelor of Science in Mechanical Engineering. After graduation Katherine joined Pratt & Whitney in East Hartford Connecticut, a division of the United Technologies Corporation. After joining Pratt & Whitney she took advantage of the United Technologies Corporation Employee Scholar Program completing a Masters in Mechanical Engineering from Rensselaer Polytechnic Institute and an MBA from Carnegie Mellon University.

Katherine started her career in 2005 working on military nozzle design. She worked on the F135 program through the validation phase of the program supporting engine test. As Pratt & Whitney launched the Geared Turbo Fan product family Katherine transitioned to engine inlet design and aerodynamics. During this time she joined the Pratt & Whitney Women's Council whose mission is to support the recruitment, development and retention of female talent by raising the awareness of career opportunities, coaching, guiding, mentoring and providing an inclusive networking environment. She progressed to President of the Council working with the team to increase the Council participation and executing events such as the Leadership Forum to celebrate female accomplishments and champion the change needed for an inclusive workplace.

Katherine moved to the Mechanical Systems engineering organization responsible for the bearing compartments and lubrication system of the engine as well as the Fan Drive Gear system, the game changing technology behind the Geared Turbo Fan. Katherine continued to lead Mechanical Systems teams supporting the different Geared Turbo Fan platforms through engine certification and entry into service. In 2015 Katherine was named an ASME Distinguished Engineer of the Year for her work on resolving a cabin odor issue on the PW1500G powered Bombardier C-Series aircraft. In 2016 Katherine was named Senior Director of the Mechanical Systems organization responsible for the fan drive gear system, bearing compartment and lubrication system designs for all current and future engine programs. In 2017 she was named Executive Director as her role was expanded to include the External engine architecture and Nacelles along with Mechanical Systems. Additionally, she continues to provide leadership to Pratt & Whitney's engineering organization at large with commitment to its incredibly talented employees who believe flight unleashes the world to go beyond.

Katherine lives in Tolland Connecticut with her husband Kevin. Together they enjoy running and traveling. They are welcoming their first child in December 2017.

Silvia Sabbadini

Material Development and Application Consulting Engineer

Avio Aero | Rivalta di Torino, Italy

Silvia was born in Torino and raised in a small town near Torino. She attended Technical University of Torino and graduated in Chemical Engineering in 1997 after spending one year in Montpellier, France to complete her thesis at the Chemical Engineering School.

After graduating Silvia changed several roles until she joined Avio in 2001 as material application engineer. She later held a management position in the area of Research & Development of new materials. She worked for several years in the field of additive manufacturing technologies, contributing to the creation of a center of excellence for additive processes near Milano.

In 2014 Silvia took the responsibility of the newly born Engineering Material Systems team within Engineering: her role was to set-up the foundation of this team, spread in several sites in Italy and in Poland.

In February 2016 she was appointed Consulting Engineer for Material Development and Application, coordinating the technical effort of all the Engineering Material Systems teams in Europe.

She travels a lot and likes visiting new countries. She has two children; her hobbies are playing volleyball, playing tennis and skiing.

Thank You Sponsors:


ASME 2019
Turbo Expo
June 17-21, 2019 | Phoenix, Arizona
Join us for ASME 2019 Turbo Expo in Phoenix, AZ!
Abstract Submission Deadline: August 28, 2018.
ASME
INTERNATIONAL GAS
TURBINE INSTITUTE

Turbo Expo 2018 Schedule at a Glance
Focus Track MRO

Sunday June 10	Monday June 11	Tuesday June 12	Wednesday June 13	Thursday June 14	Friday June 15
	Registration 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 3:00 p.m.
	Speaker Ready Room 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. –3:30 p.m.
	Session Participant Networking Coffee 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.
	Papers (5-11): Topics in Diagnostics 8:00 – 10:00 a.m.	**Papers (5-2): Measurement Techniques for Structural Health Monitoring I Papers (8-2): Gas Turbine Analysis & Optimization** 8:00 – 10:00 a.m.	**Panel (5-14) The Gas Turbine Life Cycle Through a Data Analytics Lens Papers (29-6): General Design Aspects** 8:00 – 10:00 a.m.	**Papers (24-6): Component Degradation & Failure Analysis** 8:00 – 10:00 a.m.	**Papers (35-8): Vibration and Damping of Bladed Disks Papers (32-3): Probabilistic Method Developments** 8:00 – 10:00 a.m.
	Coffee Break 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.
	Opening Session Turbo Expo Keynote Panel: MRO in the Light of Digitalization & Awards Program 10:15 a.m.– 12:15 p.m.	**Plenary: Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts** 10:15 a.m. – 11:10 a.m.	**Plenary: The MRO Digital/Data Transformation** 10:15 a.m. – 11:10 a.m.		**Papers (30-1): Developments in Optimization Methods and Parameter Studies Papers (24-8): Repairs and Coatings** 10:15 a.m.– 12:45 p.m.
		Papers (5-3): Performance Monitoring GT Papers (48-3): Cond. monitoring WT 11:15 - 12:45 a.m.	**Papers (5-4): Data Analytics and reasoning for Smart MRO** 11:15 - 12:45 a.m.		
Registration 12:00 – 6:00 p.m.		**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 2:30 p.m.	
Speaker Ready Room 12:00 – 6:00 p.m.	**Opening Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Poster Session** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Closing Ceremony** 1:30 p.m.	**Closing Lunch** 12:30 – 2:00 p.m.
Gas Turbine Segment Meeting 1:00 – 5:00 p.m.	**Papers (5-12): Topics in Instrumentation** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Tutorial (5-15): Digital Twin** 2:00 - 3:30 p.m.	**Papers (24-9): Manufacturing part** 2:00– 3:30 p.m.	**Papers (29-5): Blade Vibrational Aspects Papers (1-2): Modeling, Simulation and Validation** 2:00 - 3:30 p.m.
	Coffee Break 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	
	Papers (5-12): Topics in Instrumentation 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	**Tutorial (5-16): Digital Twin** 4:00 – 5:30 p.m.	**Papers (27-6): MRO/ Digital** 4:00– 5:30 p.m.	
	Welcome Reception 6:00 – 7:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.		
Council of Chairs Meeting 6:00 – 7:30 p.m.		**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	

Turbo Expo 2018 Schedule at a Glance
Focus Track AM

Sunday June 10	Monday June 11	Tuesday June 12	Wednesday June 13	Thursday June 14	Friday June 15
	Registration 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 3:00 p.m.
	Speaker Ready Room 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. –3:30 p.m.
	Session Participant Networking Coffee 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.
	Conference Sessions 8:00 – 10:00 a.m.	**Papers (24-2): AM Properties Papers (39-6): Design Concepts** 8:00 – 10:00 a.m.	**Papers (24-4): AM Equipment and Processes** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Papers (30-3): Emerging Methods Application Papers (35-8): Vibration and Damping of Bladed Disks** 8:00 – 10:00 a.m.
	Coffee Break 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.
	Opening Session Turbo Expo Keynote Panel: MRO in the Light of Digitalization & Awards Program 10:15 a.m.– 12:15 p.m.	**Plenary: Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts** 10:15 a.m. – 11:10 a.m. **Papers (24-3): AM Products** 11:15 - 12:45 p.m.	**Plenary: The MRO Digital/Data Transformation** 10:15 a.m. – 11:10 a.m. **Conference Sessions** 11:15 - 12:45 p.m.	**Conference Sessions** 10:15 a.m.– 12:15 p.m.	**Conference Sessions** 10:15 a.m.– 12:15 p.m.
Registration 12:00 – 6:00 p.m.		**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 2:30 p.m.	
Speaker Ready Room 12:00 – 6:00 p.m.	**Opening Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Poster Session** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Closing Ceremony** 1:30 p.m.	**Closing Lunch** 12:30 – 2:00 p.m.
Gas Turbine Segment Meeting 1:00 – 5:00 p.m.	**Tutorial (24-11): AM with Metals Part I** 2:00 - 3:30 p.m.	**Panel (24-17): AM for Aircraft Gas Turbines and Parts** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Papers (21-1): Additive Manufacturing I Papers (4-4 Part): Combustor Design & Development I** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.
	Coffee Break 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	
	Tutorial (24-12): AM with Metals Part I 4:00 – 5:30 p.m.	**Panel (24-18): AM for Industrial Gas Turbines and Parts** 4:00 – 5:30 p.m.	**Papers (31-1 Part B): Crack growth modelling Papers (46-2): Manufacturing Tolerances and Uncertainties Papers (35-10 Part B): Experimental Vibration Analysis** 4:00 – 5:30 p.m.	**Papers (21-2): Additive Manufacturing II** 4:00 – 5:30 p.m.	
	Welcome Reception 6:00 – 7:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.		
Council of Chairs Meeting 6:00 – 7:30 p.m.		**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	

Turbo Expo 2018 Schedule at a Glance
Focus Track PGC

Sunday June 10	Monday June 11	Tuesday June 12	Wednesday June 13	Thursday June 14	Friday June 15
	Registration 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 6:30 p.m.	**Registration** 7:00 a.m. – 5:30 p.m.	**Registration** 7:00 a.m. – 3:00 p.m.
	Speaker Ready Room 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m.	**Speaker Ready Room** 7:00 a.m. –3:30 p.m.
	Session Participant Networking Coffee 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.	**Session Participant Networking Coffee** 7:00 – 7:45 a.m.
	Conference Sessions 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Tutorial (4-41): Pressure Gain Combustion** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.
	Coffee Break 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.
	Opening Session Turbo Expo Keynote Panel: MRO in the Light of Digitalization & Awards Program 10:15 a.m.– 12:15 p.m.	**Plenary: Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts** 10:15 a.m. – 11:10 a.m. **Conference Sessions** 11:15 - 12:45 p.m.	**Plenary: The MRO Digital/Data Transformation** 10:15 a.m. – 11:10 a.m. **Conference Sessions** 11:15 - 12:45 p.m.	**Papers (4-7): Novel Combustor Concept II** 10:15 a.m.– 12:15 p.m.	**Conference Sessions** 10:15 a.m.– 12:15 p.m.
Registration 12:00 – 6:00 p.m.		**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 6:30 p.m.	**Expo Open** 12:30 – 2:30 p.m.	
Speaker Ready Room 12:00 – 6:00 p.m.	**Opening Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Poster Session** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m.	**Expo Lunch** 12:30 – 2:00 p.m. **Closing Ceremony** 1:30 p.m.	**Closing Lunch** 12:30 – 2:00 p.m.
Gas Turbine Segment Meeting 1:00 – 5:00 p.m. *Rogaland, Thon Hotel Arena*	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Panel (4-35): Pressure Gain Combustion** 2:00– 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.
	Coffee Break 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m.	
	Conference Sessions 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	**Panel (4-35): Pressure Gain Combustion** 4:00– 5:30 p.m.	
	Welcome Reception 6:00 – 7:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.	**Expo Hall Reception** 5:00 – 6:30 p.m.		
Council of Chairs Meeting 6:00 – 7:30 p.m.		**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	
		Women in Engineering Event/ Dinner 7:45 – 10:30 p.m.	**ECE/Student Mixer** 6:45 – 8:00 p.m.		

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.

Student Advisory Committee Members

Chair
Zhiping Mao, *Duke University*

Vice Chair
Wisher Paudel, *University of Virginia*

Secretary
Samuel Barak, *University of Central Florida*

Past-Chair
Jacob Snyder, *Penn State University*

Student/Early Career Mixer

Wednesday, 6:45 – 8:00 p.m.
Unwind after a full day of technical sessions and exhibits with fellow engineering students and early career engineers. This popular event allows students to make new friends and build their professional network in a casual evening atmosphere. Complimentary refreshments will be provided.

SAC Tutorial Sessions

Contributing to Scientific Advancement: Fundamentals on how to Craft an Effective Paper Review

Tuesday, June 12 | 8:00 - 10:00 am | Svalbard Room, Norway Trade Fairs

Dr. Piero Colonna, Professor of Propulsion and Power, Delft University of Technology

This tutorial session will discuss the importance of quality peer reviews to the technical community and give best practice for creating reviews that are beneficial to the author(s). Additionally, this tutorial will walk through the steps of the review process and will pose best practices for responding to paper reviews. Discussion among session participants will be encouraged through the use of example paper reviews.

Student Poster Competition

Tuesday, June 12 | 12:30 – 2:00 pm | Exhibit Hall D

The Student Advisory Committee is, once again, sponsoring a student poster session at ASME Turbo Expo 2018. Student posters will be on display on the main exposition floor on Tuesday, June 12th. Student poster finalists will be on display on Wednesday, June 13 from 12:30 – 2:00 pm. Be sure to stop by the poster session to see the results of their work and encourage them to become active in ASME.

Cash Prizes for Student Poster Session Winners

Cast your vote for the People's Choice Best Student Poster – enter your selection at the computer station at the entrance to the exhibit hall.

1st place - 4000 NOK

2nd place - 1900 NOK

People's Choice - 500 NOK

Student News

2018 Student Advisory Committee Travel Award Winners

Raghu Veera Manikantachari, Kancherla
University of Central Florida

Owen Marcus Pryor
University of Central Florida

Simone Giorgetti
Université Libre de Bruxelles

Patrick Neumann
Technical University Berlin

Jee Loong Hee
The University of Nottingham

Zhe Liu
Purdue University

Valeria Andreoli
Purdue University

Amirabas Bakhtiari
Bundeswehr University Munich

James Braun
Purdue University

Gen Fu
Virginia Tech

Christopher Paul Bowen
The Ohio State University

Nian Wang
Texas A&M Univerisity

Wenqiang Zhang
Imperial College London

Nicolas Ulysse Poujol
Ecole Centrale de Lyon

Francesca De Domenico
University of Cambridge

Utkudeniz Ozturk
Polytechnic University of Catalonia

Luisana Calderon
University of Central Florida

Shawn Siroka
Penn State University

Xin Deng
University of Virginia

Andres Curbelo
University of Center Florida

2018 Young Engineer Turbo Expo Participation Award Winners

Alireza Ameli
Lappeenrants University of Technology

Reid Berdanier
Penn State University

Diogo Berta Pitz
University of Surrey

Tania Sofia Cacao Ferreira
von Karman Institute/Universite Catholique de Louvain

Bogdan Cezar Cernat
von Karman institute for Fluid Dynamics

Wyatt Culler
Penn State University

Hanna Ek
Georgia Institute of Technology

David Gonzalez Guadrado
Purdue University

Mohammad Arif Hossain
The Ohio State University

Sunghwa Jeung
Ingersoll Rand

R. Krishna Chaitanya Kalvakala
University of Illinois at Chicago

Kathryn Kirsch
Pennsylvania State University

Weihong Li
Tsinghua University

Shyang Maw Lim
KTH Royal Institute of technology

Xueliang Lu
Texas A&M University

Jomar Mendoza
University of Southern California / UTRC

Gladys C. Negtich
University of Oxford

Jorge Saavedra
Purdue University Mechanical Engineering Graduate School

Prashant Singh
North Carolina State University

Charles Stuart
Queen's University Belfast

Jonathan Tobias
University of Alabama

Cori Watson
University of Virginia

Yu Xia
Imperial College London UK

Student Mixer | Wednesday, June 13, 6:45 -8:00 pm

Student Poster Presenters

Gulnaaz Afzal, University of Cincinnati
Design, Manufacture, and Testing of Hyperloop UC

Max Aginskiy, New York Institute of Technology
Green Power Tower

Roberto Agromayor, NTNU
Repeating Stages for Axial Turbines in Low Temperature Rankine Cycles

Aldo Alcantara Viruete, Instituto Politécnico Nacional
Design and Numerical Study of Variable Inlet Guide Vanes on Centrifugal Compressor

Abdulaziz Alhamoud, Texas A&M University
A Simplified Analytical Approach to Design Hydrodynamic Bearings for a Single Stage In-Between-Bearing Process Pump

Maria Alessandra Ancona, University of Bologna
Load Allocation Strategies for Efficiency

Yukiya Arai, Hosei University
Extending the Operating Range of Ultra-Low NOx Emissions by Injecting Lean Secondary Mixtures into Combustion Products from the Reverse-Jet Stabilized Primary Stage

Amirabas Bakhtiari, Bundeswehr University Munich
Impingement – Effusion Cooling for Lowe-Emission Combustors

Rob Bastiaans, Eindhoven University of Technology
Design of a 100kW Premixed Hydrogen Gas Turbine Combustor

Rob Bastiaans, Eindhoven University of Technology
Simulations of Bluff-Body Stabilized Laminar Premixed Flames near the Lower Flammability Limit Using FGM

Mathieu Beland, Université Laval
Design of a Low Power Non-confined, Non-Premixed and Swirled Stabilised Kerosene Burner to Study Fire-Resistant Composite Materials Used on Gas Turbine Engine

Antonio Berger, Helmut Schmidt University
Investigation of Performance and Efficiency of a Control Stage Turbine Under Different Partial Admission Degrees

Damien Bonhomme, ISAE-SUPAERO
77332 - A Study of Hybrid-Electric Turbofan Concepts

Elissavet Boufidi, Von Karman Institute/Université Catholique de Louvain
A Methodology for Advanced Turbulence Measurements in Complex Turbomachinery Flows

James Braun, Purdue University
Design and Optimization of Fluid Machinery Suitable for High-Speed Unsteady Flows

Anna Bru Revert, University of Oxford
Aerodynamics and Heat Transfer in Turbine Rim Sealing Flows

Philip Erik Buschmann, NTNU
Intrinsic Modes in an Annular Combustion Chamber

Daniel Castillo, Imperial College London
Luminescent Thermal Memory Paints

Lijian Cheng, Northwestern Polytechnical University
The Effect of Turbulence Intensity on Full Coverage Film Cooling for a Turbine Guide Vane

Seok Min Choi, Yonsei University
Effect of Wake on Heat Transfer of Turbine Blade Tip and Shroud with Various Type of Rim Configurations

Khaoula Derbel, Budapest University of Technology and Economics
Linear Dynamic Mathematical Model and Identification of Micro Turbojet Engine with Turbofan Power Ratio Control

Francesco Di Sabatino, KAUST
Effect of Laminar Flame Properties on the Transfer Function of a Swirl-Stabilized Premixed Flame

Antoine Durocher, McGill University
Uncertainty Quantification of NO Concentrations in Premixed Methane-Air Flames

Nico Eckert, Technical University of Munich
Dynamic Analysis of Rotor Seal Systems

Student Poster Presenters

Theofilos Efstathiadis, Aristotle University of Thessaloniki (AUTH)
Evaluation of the Heat Transfer Coefficient Using the Transient Liquid Crystals Technique

Mikael Mosbech Eronen, Technical University of Denmark
Progresses in Calibrating Active Magnetic Bearings with Numerical and Experimental Approaches

Zhongyi Fu, Northwestern Polytechnical University
Experimental Study of the Influence of Inclination Angle and Diffusion Angle on the Film Cooling Performance of Chevron Shaped Hole

Daisy Galeana, San Diego State University/University of California San Diego
Experimental Study of a Swirl Flow Using 3-D Stero-PIV

Apostolos Gkountas, Aristotle University of Thessaloniki
Design and Performance Investigation of a Fan for Aeronautical Applications

Tamara Guimarães Bucalo, Virginia Tech
Experimental Investigation of Single-Vortex Inlet Distortions

Janneck Harbeck, Helmut Schmidt University
3D LDA Evaluation Routine for Determining the Reynolds Stress Tensor with Associated Confidence Intervals

Qijiao He, Northwestern Polytechnical University
The New Framework of UGKS-NCCR for Solving Continuum-Rarefied Gas Flows

Seongpil Joo, Seoul National University
Flame Transfer Function of Fuel-air Nozzle Characteristics in a Model Gas Turbine Combustor

Eui Yeop Jung, Yonsei University
Local Heat Transfer Characteristics of the Impingement/ Effusion Cooling on a Concave Surface

Raghu Veera Manikantachari Kancherla, University of Central Florida
The Effect of Dilution and Pressure on Turbulence-Chemistry Interaction

Foster Kholi, Pusan National University
Transient Operations of Cooled Cooling Air Heat Exchanger

Norman Kienzle, University of Bochum
Improving the Accuracy of Indirect Optimization by a Filter Algorithm

Hyung-Jin Kim, Sungkyunkwan
Optimal Design for Dihedral Angle of Stator in an Axial Compressor Using Design of Experiment

Jae Hoon Kim, Korea University
Numerical Study of the Effect of Inclined Pressure & Suction Surface Rim of Squealer Tip on Aerodynamic Performance & Heat Transfer of Turbine

Seon Ho Kim, Yonsei University
Effect of Jet-to-Surface Spacing on Heat Transfer to Submerged Single Impinging Jet of Supercritical CO_2

Taehyun Kim, Yonsei University
Effect of Rib Turbulators on Convective Heat Transfer of Supercritical CO_2

Thank You ASME Turbo Expo Student Poster Judges!

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

Klaus Brun, Southwest Research Institute
Jan Ehrhard, Continental Corporation
Friedrich Fröhlig, MTU Fridrichshafen GmbH
Eisaku Ito, MHI Takasago R&D Center
Anestis Kalfas, Aristotle University of Thessaloniki
Akin Keskin, Rolls-Royce
Ashok Koul, 3M Committee
Stephen Lynch, Penn State
Massimo Masi, University of Padova
Andrew Nix, W Virginia University
Guillermo Paniagua, Purdue University
Luca Porreca, MAN
James Rutledge, AFIT
Laith Zori, Ansys

Student Poster Presenters

Jaehong Lee, Inha University
Performance Diagnosis Logic for Heavy-Duty Gas Turbines Considering Operation Strategy

Shan Li, Tsinghua University
The Emission Characteristics of Air-staged CH4/NH3 Combustion at Elevated Temperature and Pressure

Syed Mashruk, Cardiff University
Appraisal of Quantitative NO-LIF Imaging with a Conical Premixed Flame and Numerical Simulations

Akshay Mate, National Institute of Technology, Warangal
A Role of Additive Manufacturing in Fabrication and Repairing of Gas Turbine Blades

Jomar Mendoza, University of Southern California
Inlet Turbulence Synthetization for High-Fidelity CFD

Luca Miller, Plymouth University
Advanced X-ray Image Processing Method and Tool to Support Aero Engine Design and Behavioral Understanding

Albert Mucci, Pusan National University
Transient Operations of Cooled Cooling Air Heat Exchanger

Patrick Neumann, Technische Universität Berlin
Numerical Investigation of Aeroelastic Stability of a Compressor Cascade with Distorted Inlet Flow

Razvan Nicoara, Politehnica of Bucharest
Numerical and Experimental Estimation of Turbine Maps for a Micro-Axial Gas Turbine

Vaclav Novotny, Czech Technical University in Prague
3D Printing for Low-Cost Low-Parameters and Rapidly Developed Turboexpanders for Decentralized Micro-Power Systems

Saverio Ottaviano, University of Bologna
Experimental Investigation of a Gear Pump Working in Micro-Scale ORC Power System

Utkudeniz Ozturk, Polytechnic University of Catalonia
Modeling High Temperature Deformation Behavior of ALLVAC 718Plus TM Consideration of Precipitation Effects

Sudhanshu Pandey, Pusan National University
Aero Thermal Performance of Cooled Cooling Air Heat Exchanger

Alessio Pappa, University of Mons
Large Eddy Simulation of a Non-Reactive Flow in a Typical Micro Gas Turbine Combustion Chamber

Chul Park, Yonsei University
Effect of Channel Geometry on Heat Transfer of Impingement Jet on Corrugated Structure

Maximilian Passmann, University of Applied Sciences Muenster
Focusing Schlieren Visualization of an Idealized Transonic Turbine Tip-Leakage Flow

Thibaud Plantegenet, Université de Poitiers
Experimental Analysis of Large Amplitude Synchronous Vibrations Induced by Journal Asymmetric Heating

Owen Pryor, University of Central Florida
High Speed Camera Imaging for Dynamics of CH4/O2/CO2 Mixtures in a Shock Tube

Jessica Rosati, University of Bologna
Development of a Magnetocaloric System Prototype

Ibrohim Rustamov, Tsinghua University
Integrated Fluid-Structure Interaction Simulations of Gas Foil Bearing Performance

Lei Shi, Bejhang University
Influence of the Clearance Size on Broadband Spectral Characteristics in a Compressor Cascade

Shawn Siroka, Penn State University
Penn State Thin Film Heat Flux Gauge Capabilities

Patrick Zeno Sterzinger, Graz University of Technology
Loss Decomposition of a Turbine Center Frame Flow

Student Poster Presenters

Henrik von der Haar, Leibniz Universität Hannover
Experimental Defect Detection in a Model Combustion Chamber by Analyzing Exhaust Gases

Zhanchao Wang, Tsinghua University
The Influence of the Equalizing Bean Structure on the Tilting Pad Thrust Bearing During Start-Up and Shut-Down
Zhihao Wu, Northwestern Polytechnical University
Prediction of Flow Instability Using Eigen Analysis

Yu Xia, Imperial College London
Effect of Combustion Chemistry on LES Prediction of the Flame Describing Function for a Pressurised Gas Turbine Combustor

Bijie Yang, Imperial College London
Loss Mechanisms of Two Highly Loaded Mixed Flow Rotors and Optimization

Lin Ye, Northwestern Polytechnical University
Effect of Ribs Configuration and Arrangement on the Film Cooling with Ribbed Cross-Flow Coolant Channel

Manuel Zenz, Graz University of Technology
Acoustic, Aerodynamic and Aeroelastic Comparison of Different Low Pressure Turbine Exit Guide Vane Designs

Gaolong Zhang, Tsinghua University
Energy Dissipation Based Wear Model for Graphite Sliding Against Cemented Carbide

Silun Zhang, Université de Poitiers
Numerical Analysis of Large Amplitude Synchronous Vibrations Induced by Journal Asymmetric Heating

ASME 2019 Gas Turbine India Conference

December 2019

The Most Advanced Turbomachinery Conference in India

ASME Gas Turbine India Conference is the must-attend event for turbomachinery professionals. Over 400 leading experts will gather to present their peer-reviewed research and the latest technology advancements in the industry. If warranted by review, papers may also be recommended for publication in ASME's Journal of Turbomachinery or Journal of Engineering for Gas Turbines and Power.

Technical Content

- 2-day conference packed with technical education and knowledge exchange
- Panel sessions featuring industry professionals
- Tutorials for those looking to learn about a new topic

Networking Opportunities

- Meet and connect with colleagues from Global power exhibition
- Coffee breaks, lunches, and a dinner

ASME
INTERNATIONAL GAS TURBINE INSTITUTE

Session Participant Information

Session Participant Networking Coffee

Monday, June 11 to Friday, June 15 -7:00 – 7:45 am
Hall C

On the day of your scheduled presentation, a table will be reserved for your session. Meet with the other session participants and discuss session logistics. All session organizer materials will be distributed at this meeting. Complimentary coffee and pastry provided.

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 CDROM or USB flash drive. There will not be a central network server for the sessions.

Audiovisual Equipment Provided

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

Speaker Ready Room

Spitsbergen Room
Sunday, June 10 12:00 pm – 6:00 pm
Monday, June 11 7:00 am – 5:30 pm
Tuesday, June 12 7:00 am – 5:30 pm
Wednesday, June 13 7:00 am – 5:30 pm
Thursday, June 14 7:00 am – 5:30 pm
Friday, June 15 7:00 am – 3:30 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 of 11675 NOK for 5-Day or 9700 NOK for 3-Day. Onsite registration is located in the West Entrance of the Norway Trade Fairs convention center.

Badge Ribbons

Role and attendance ribbons are available at the Information Desk in Registration. See the display for available options.

Final Papers DVD/Paper Printing Stations

All Technical Conference registrants are eligible to receive a DVD containing the collection of the technical papers accepted for presentation and publication plus online access. Presentations, such as panels or posters, that do not have an accompanying paper are considered to be "Oral Presentation Only" and do not appear in the system. Please note that this is NOT the official proceedings of the Conference, which is published after the Conference and is also made available online on the ASME Digital Collection at http://asmedigitalcollection.asme.org. As such, papers that appear in the system may not be cited until after the official Proceedings have been published. Registered ASME Turbo Expo 2018 technical conference attendees may view and print accepted conference papers at the 2018 Paper Printing Station in the Registration area.

Need Assistance?

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

The Exposition

2018 Exhibit Directory

Round out your conference experience by spending time Tuesday through Thursday in the exhibit hall featuring the latest technology offered by leading companies in the industry and an exhibitor presentation stage. Lunches and receptions in the exhibit hall each day will provide relaxed, yet focused networking opportunities.

Exposition Open:

Tuesday, June 12.....12:30 p.m. - 6:30 p.m.

Wednesday, June 13.....12:30 p.m. - 6:30 p.m.

Thursday, June 14.....11:30 a.m. - 2:30 p.m. Don't miss the Turbo Expo Exhibit Closing Ceremony at 1:30 p.m.

Table of Contents

Thank you to our Exhibit Advisory Committee. Please stop by and visit with our EAC members and give them your suggestions and feedback for making the Turbo Expo Exposition an even better event. A complete listing can be found on page 30. If you are interested in joining this committee, contact the ASME IGTI Expositions Department at igtiexpo@asme.org.

If you are interested in exhibiting at the 64th ASME Turbo Expo in Phoenix, Arizona USA in June 2019, contact ASME IGTI at igtiexpo@asme.org or stop by the ASME IGTI Exhibit Sales Office in the exhibit hall to secure your booth or one of the sponsorship opportunities.

Reminders:

No photographs can be taken in the exhibit hall without permission of Show Management and/or the exhibiting company.

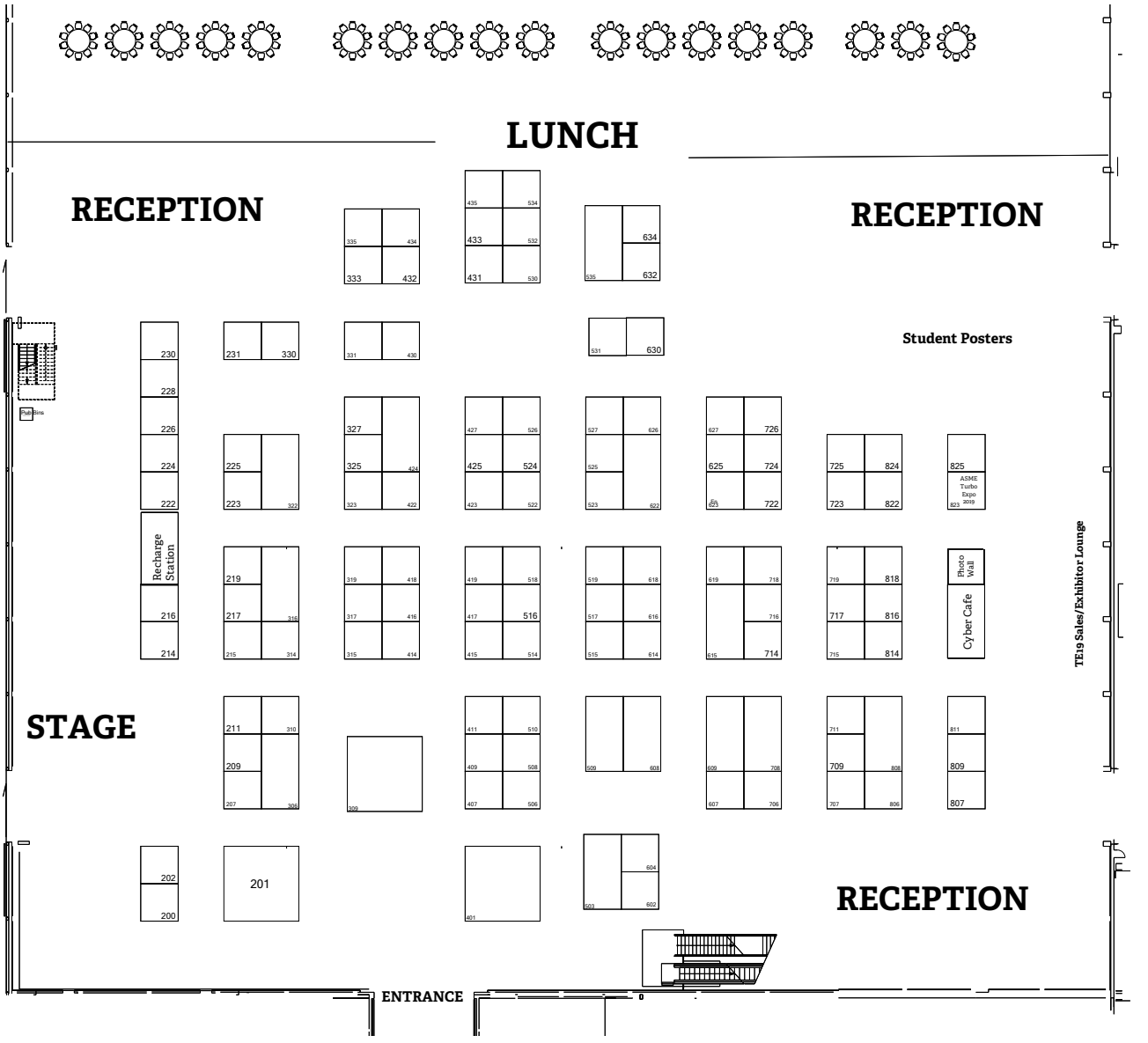
Place your votes for the People's Choice Best Booth Award and the People's Choice Best Student Poster at the entrance of the exhibit hall.

See security personnel for emergencies and first aid assistance.

Presentation Schedule

Tuesday	
1:00 – 1:30 pm	Simulation Innovations Speed Turbomachinery Design and Analysis presented by Andre Braune, Technical Account Manager from ANSYS
1:45 – 2:15 pm	Thermal-Fluid System Modeling in Turbomachinery presented by Clement Joly from SoftinWay
2:30 – 3:00 pm	Modern Uncertainty Quantification with SmartUQ presented by Dr. Mark Andrews from SmartUQ
3:15 - 3:45 pm	Environmental Barrier Coatings (EBCs) & Ceramic Matrix Composites (CMCs) for Environmentally-Friendly Gas Turbine Engines presented by Dr. Rogerio Lima from National Research Council of Canada
4:00 – 4:30 pm	MELD: Newest Innovations in Additive Manufacturing presented by Nanci Hardwick from Aeroprobe
4:45 – 5:15 pm	OMNIS: A Unique Engineering Environment Encompassing All Our State-Of-The-Art Technology Including Our Latest Lattice Boltzmann Technology presented by Yannick Baux from Numeca
Wednesday	
1:00 – 1:30 pm	Use of Simulation in Additive Manufacturing presented by ave Conover, Corporate Fellow from ANSYS
1:45 – 2:15 pm	Hydrodynamic Journal Bearing Optimization Considering Rotor Dynamic Constraints presented by Abdul Nassar from SoftinWay
2:30 – 3:00 pm	Environmental Barrier Coatings (EBCs) & Ceramic Matrix Composites (CMCs) for Environmentally-Friendly Gas Turbine Engines presented by Dr. Rogerio Lima from National Research Council of Canada
3:15 - 3:45 pm	Simulation-Based Digital Twins can Improve Product and Process Performance presented by ANSYS
4:00 – 4:30 pm	Advanced Instrumented Stator Blades Made By Additive Manufacturing presented by Dipl.-Ing. Katharina Kreitz from Vectoflow GmbH
4:45 – 5:15 pm	GT Component Rub Indications by Non-Intrusive Sensor Systems by Lyder Moen from Dynatrend
Thursday	
1:30 - 2:15 p.m.	ASME Turbo Expo Closing Ceremony and Kick-Off for Phoenix, Arizona USA

The Exposition Floor Plan



The Exposition

Exhibit Advisory Committee

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

Dr. Leonid Moroz | SoftInWay Inc.
15 New England Executive Park
Burlington, MA 01803 USA
Term: 2017-2020

Dr. Benjamin O'Shea | Praewest Präzisionswerkstätten Dr.-Ing.Heinz-Rudolf Jung GmbH & Co.
Martinsheide 7
Bremen, 28757 Germany
Term: 2017-2020

Dr. Jakob Hermann
IfTA Ingenieurbuero fuer Thermoakustik GmbHIndustriestr. 33 D-82194
Groebenzell Germany
Term: 2018-2021

Barbara Shea | Concepts NREC
285 Billerica Road – Suite 102
Chelmsford, MA 01824
Term: 2018-2021

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

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

Exhibit Hall: Best Exhibit Display and Student Poster Awards

People's Choice for Best Booth Display

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

500 NOK 1900 NOK 4000 NOK

Three cash prize winners will be announced during the Closing Ceremony in the Exhibit Hall on Thursday, 1:30 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 1:00 p.m. on Thursday, June 14.

Place your vote for both categories:

Large Display (for booths 18sqm and larger)

AND

Small Display (for booths 9sqm in size)

Congratulations to the 2017 People's Choice Award Winners

Large Display: MMP Technology

MMP® TECHNOLOGY

Small Display: Vectoflow

vectoflow measurements in fluids

People's Choice for Best Student Poster

Please take a moment to also vote for the Best Student Poster. Voting kiosk can be found at the entrance of the exhibit hall! Stop by and vote Tuesday to Thursday.

VISIT THE ONLINE EXHIBITOR DIRECTORY FOR EXHIBITING COMPANY LISTINGS

www.rolls-royce.com/futuretechnology

We're working on technology today that will fly his kids around the world.

For 100 years we have inspired generations to take the best that exists and make it better.

Today, as the No.1 engine company for new widebody aircraft, our customers have come to expect the world-leading technology, performance and support that our global teams provide around the clock. But intelligent innovators never stand still - at the forefront of the aerospace industry, we have a responsibility to anticipate the solutions that our customers will need many decades from now.

In just a few years, he will see that this future started life long before he did with our Advance and UltraFan® engine families - demonstrating our long-term commitment to keep our customers at the top of their game and to continue inspiring for many generations to come.

We deliver the best jet engines in the world

The story continues...

ROLLS ROYCE

ASME IGTI Committee Leaders

Aircraft Engine
Current Chair: Wing Ng
Current Vice Chair: Wilfried Visser
Incoming Chair: Wilfried Visser
Incoming Vice Chair: Konstantinos Kyprianidis

Ceramics
Current Chair: Sai Sarva
Current Vice Chair: Jun Shi
Incoming Chair: Jun Shi
Incoming Vice Chair: Rajesh S. Kumar

Coal, Biomass & Alternative Fuels
Current Chair: Ajay Agrawal
Current Vice Chair: Pierre Q. Gauthier
Incoming Chair: Pierre Q. Gauthier
Incoming Vice Chair: Dr Marina Braun-Unkhoff

Combustion, Fuels & Emissions
Current Chair: Mike Klassen
Current Vice Chair: Christian Oliver Paschereit

Controls, Diagnostics & Instrumentation
Current Chair: Lorenzo Ferrari
Current Vice Chair: Sebastian Borguet
Incoming Chair: Peter Loftus
Incoming Vice Chair: Liang Tang

Cycle Innovations
Current Chair: David Sanchez
Current Vice Chair: Mario L. Ferrari

Education
Current Chair: Sabri Deniz
Current Vice Chair: Devin O'Dowd
Incoming Chair: Ioanna Aslanidou
Incoming Vice Chair: Subith Vasu

Electric Power
Current Chair: Jeffrey A. Benoit
Current Vice Chair: Seyfettin C. (John) Gulen
Incoming Chair: Thomas Christiansen
Incoming Vice Chair: Rick Tomlinson

Fans and Blowers
Current Chair: Alessandro Corsini
Current Vice Chair: Johan Van der Spuy
Incoming Chair: Johan Van der Spuy
Incoming Vice Chair: Giovanni Delibra

Heat Transfer
Current Chair: Phil Ligrani
Current Vice Chair: John Blanton
Incoming Chair: John Blanton
Incoming Vice Chair: Marc D. Polanka

Industrial & Cogeneration
Current Chair: Yiguang Li
Current Vice Chair: Francesco Melino

Manufacturing Materials & Metallurgy
Current Chair: Ashok Koul
Current Vice Chair: Douglas Nagy
Incoming Chair:
Incoming Vice Chair:

Marine
Current Chair: Morgan Hendry
Current Vice Chair: Jeffrey S. Patterson

Microturbines, Turbochargers & Small Turbomachines
Current Chair: Keun Ryu
Current Vice Chair: Fabrizio Reale

Oil & Gas Applications
Current Chair: Michele Pinelli
Current Vice Chair: Klaus Brun

ORC Power Systems
Current Chair: Teemu Turunen-Saaresti
Current Vice Chair: Marco Astolfi

Steam Turbine
Current Chair: Ivan McBean
Current Vice Chair: Markus Schatz

Structures & Dynamics
Current Chair: Harald Schoenenborn
Current Vice Chair: Jerzy T. Sawicki
Incoming Chair: Jerzy T. Sawicki
Incoming Vice Chair: Michael Gorelik

Student Advisory
Current Chair: Zhiping Mao
Current Vice Chair: Wisher Padel
Incoming Chair: Wisher Padel

Supercritical CO2
Current Chair: Eric Clementoni
Current Vice Chair: Grant Musgrove

Turbomachinery
Current Chair: Ricardo Martinez-Botas
Current Vice Chair: Dale Van Zante

Wind Energy
Current Chair: George Pechlivanoglou
Current Vice Chair: Alessandro Bianchini

Stop by the exhibit to see the World's oldest Gas Turbine Rotor

Committee Meeting Schedule

Group	Date	Time	Location
Aircraft Engine	Thursday, June 14	6:00-7:30 PM	A1-4 + A1-5
Ceramics	Wednesday, June 13	6:00-7:30 PM	Jan Mayen 3
Coal, Biomass & Alternative Fuels	Wednesday, June 13	6:00-7:30 PM	A1-3
Combustion, Fuels & Emissions	Tuesday, June 12	6:00-7:30 PM	Jan Mayen 2
Controls, Diagnostics & Instrumentation	Wednesday, June 13	6:00-7:30 PM	Akershus (Thon Hotel)
Cycle Innovations	Tuesday, June 12	6:00-7:30 PM	A1-3
Education	Wednesday, June 13	6:00 - 7:30 PM	Hordaland (Thon Hotel)
Electric Power	Wednesday, June 13	12:00 - 1:00 PM	Business Centre Office
Exhibit Advisory Committee	Wednesday, June 13	10:30 - Noon	Exhibitor Stage, Hall D
Fans and Blowers	Thursday, June 14	6:00-7:30 PM	Akershus (Thon Hotel)
Gas Turbine India Chapter Meeting	Wednesday, June 13	1:30 - 2:15 PM	A1-6
Heat Transfer	Wednesday, June 13	6:00-7:30 PM	Svalbard
Industrial & Cogeneration	Tuesday, June 12	6:00-7:30 PM	A1-6
Manufacturing Materials & Metallurgy	Wednesday, June 13	6:00-7:30 PM	Jan Mayen 1
Marine	Wednesday, June 13	6:30 PM	Off-Site
Microturbines, Turbochargers & Small Turbomachines	Wednesday, June 13	6:00-7:30 PM	Jan Mayen 3
Oil & Gas Applications	Thursday, June 14	6:00-7:30 PM	Jan Mayen 1
ORC Power Systems	Thursday, June 14	6:00 - 7:30 PM	A1-6
Steam Turbine	Wednesday, June 13	6:00-7:30 PM	A1-4 + A1-5
Structures & Dynamics	Tuesday, June 12	6:00-7:30 PM	A1-4 + A1-5
Student Advisory	Thursday, June 14	5:30-7:00 PM	Svalbard
Supercritical CO2	Wednesday, June 13	6:00-7:30 PM	Jan Mayen 2
Turbomachinery	Tuesday, June 12	6:00-7:30 PM	Svalbard
Wind Energy	Thursday, June 14	6:00-7:30 PM	Hordaland (Thon Hotel)

Turbo Expo Committee Point Contacts

Aircraft Engine
Joseph Howard, *Honeywell*

Ceramics
Sai Sarva, *GE Global Research*

Coal, Biomass & Alternative Fuels
Ajay Agrawal, *University of Alabama*

Combustion, Fuels & Emissions
Rudy Dudebout, *Honeywell Aerospace*
Bernd Prade, *Siemens AG KWU*
Gilles Bourque, *Siemens Canada*

Controls, Diagnostics & Instrumentation
Peter Loftus, *Rolls Royce*
Liang Tang, *Pratt & Whitney*

Cycle Innovations
Konstantinos Kyprianidis, *Mälardalen University*

Education
Sabri Deniz, *Lucerne University of Applied Sciences*
Devin O'Dowd, *United States Air Force*

Electric Power
Rick Tomlinson, Chevron
Seyfettin Can Gulen, *Bechtel Infrastructure & Power Inc.*

Fans & Blowers
Alessandro Corsini, 'Sapienzà *University of Rome*
Chunill Hah, *NASA Glenn Research Center*

Heat Transfer: Additive Manufacturing
Bijay K. Sultanian, *Takaniki Communications, LLC.*

Heat Transfer: Combustors (with Combustion, Fuels & Emissions)
Bijay K. Sultanian, *Takaniki Communications, LLC.*

Heat Transfer: Conjugate Heat Transfer
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Tom Shih, *Purdue University*

Heat Transfer: Experimental Film Cooling
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Srinath Ekkad, *North Carolina State University*

Heat Transfer: Experimental Internal Cooling
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Hee-Koo Moon, Yonsei University

Heat Transfer: General Computational Heat Transfer
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Harika S. Kahveci, *Middle East Technical University (METU)*

Heat Transfer: General Experimental Heat Transfer
Bijay K. Sultanian, *Takaniki Communications, LLC.*
James Downs, *Florida Turbine Technologies Inc.*

Heat Transfer: Internal Air Systems & Seals (with Turbomachinery)
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Peter Smout, *Rolls-Royce*

Heat Transfer: Multiphysics Modeling & Optimization
Bijay K. Sultanian, *Takaniki Communications, LLC.*

Heat Transfer: Numerical Film Cooling
Bijay K. Sultanian, *Takaniki Communications, LLC*
Ardeshir Riahi, *Honeywell Aerospace*

Turbo Expo Committee Point Contacts

Heat Transfer: Numerical Internal Cooling
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Domenico Borello, *Sapienza University of Rome*

Heat Transfer: Special Sessions
Bijay K. Sultanian, *Takaniki Communications, LLC.*

Heat Transfer: Tutorials
Bijay K. Sultanian, *Takaniki Communications, LLC.*
Andrew Nix, *West Virginia University*

Industrial & Cogeneration
Yiguang Li, *Cranfield University*

Manufacturing Materials & Metallurgy
Ashok Koul, *Life Prediction Technologies Inc.*

Marine
Morgan Hendry, *SSS Clutch Company, Inc.*
Desiree Deshmukh, *NSWCPD*

Microturbines, Turbochargers & Small Turbomachines
Keun Ryu, *Hanyang University*

Oil & Gas Applications
Michele Pinelli, *University of Ferrara*

Organic Rankine Cycle Power Systems
Teemu Turunen-Saaresti, *Lappeenranta University of Technology*
Marco Astolfi, *Politecnico di Milano*

Steam Turbines
Henning Almstedt, *Siemens AG*
Grant Ingram, *Durham University*

Structures & Dynamics: Aerodynamic Excitation & Damping
Michael Gorelik, *FAA*
Maria Angelica Mayorca, *Siemens Industrial Turbomachinery*

Structures & Dynamics: Bearing & Seal Dynamics
Michael Gorelik, *FAA*
Keun Ryu, *Hanyang University*

Structures & Dynamics: Emerging Methods in Design & Engineering
Michael Gorelik, *FAA*
Chris Hulme, *GE Switzerland*

Structures & Dynamics: Fatigue, Fracture & Life Prediction
Michael Gorelik, *FAA*
Martin Hughes, *Siemens Industrial Turbomachinery Ltd.*

Structures & Dynamics: Probabilistic Methods
Michael Gorelik, *FAA*
Andrew Milliken, *Pratt & Whitney*

Structures & Dynamics: Rotordynamics
Michael Gorelik, *FAA*
Thomas Weiss, *Rolls Royce Deutschland Ltd & Co. KG*

Structures & Dynamics: Structural Mechanics, Vibration & Damping
Michael Gorelik, *FAA*

Student Advisory
Zhiping Mao, *Duke University*

Student Poster
Zhiping Mao, *Duke University*

Supercritical CO^2 Power Cycles
Grant Musgrove, *Southwest Research Institute*

Turbomachinery: Axial Flow Fan & Compressor Aerodynamics
Bronwyn Power, *Rolls-Royce plc*

Turbomachinery: Axial Flow Turbine Aerodynamics
Luca Porreca, MAN Diesel&Turbo Schweiz AG

Turbo Expo Committee Point Contacts

Turbomachinery: Deposition, Erosion, Fouling, and Icing
Jeffrey Bons, Ohio State University

Turbomachinery: Design Methods & CFD Modeling for Turbomachinery
Akin Keskin, Rolls-Rolls plc

Turbomachinery: General Interest
Dale Vanzante, NASA Glenn Research Center

Turbomachinery: Multidisciplinary Design Approaches, Optimization & Uncertainty Quantification
Ingrid Lepot, Cenaero

Turbomachinery: Noise, Ducts and Interactions
Andreas Peters, GE Aviation

Turbomachinery: Radial Turbomachinery Aerodynamics
Jan Ehrhard, Continental Automotive GmbH

Turbomachinery: Unsteady Flows in Turbomachinery
Natalie Smith, Southwest Research Institute

Wind Energy
George Pechlivanoglou, HFI TU Berlin

Registration

Registration Location/Hours

Norway Trade Fairs (Lillestrøm), West Entrance
Sunday, June 10 - 12:00 pm – 6:00 pm
Monday, June 11 - 7:00 am – 5:30 pm
Tuesday, June 12 - 7:00 am – 6:30 pm
Wednesday, June 13 - 7:00 am – 6:30 pm
Thursday, June 14 - 7:00 am – 5:30 pm
Friday, June 15 - 7:00 am – 3:00 pm

Technical Conference Registration

- Access to every session in the Technical Conference
- Final Papers DVD comprised of all papers published for TURBO EXPO 2018
- Professional Development Hours (PDHs) Certificate
- Admission to the following networking events:
    - Grand Opening: Turbo Expo Keynote Panel & Awards Program, MRO in the Light of Digitalization (June 11)
    - Welcome Reception (June 11)
    - Tuesday Plenary Panel: Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts (June 12)
    - Wednesday Plenary Panel: The MRO Digital/Data Transformation (June 13)
- Daily Lunch (June 11 – 15)
- Exhibition (June 12 – 14)
- Exhibit Hall Reception (June 12 – 13)
- Opportunity to attend Facility Tours

Free ASME Membership

Non-member 5-day and 3-day registrants, plus students are eligible to receive a complimentary one-year ASME membership. Registrants in this category will receive an email invitation within 90 days after the Show from ASME Membership with the invitation to join.

Badge/Tickets

Your badge is encoded with all payments made through conference registration. It is your only ticket and must be presented for admission to ticketed functions.

Security

For security reasons, your badge must be worn at all official functions including Technical Conference, the Welcome Reception, the Keynote Sessions, luncheons and in the Exposition.

PDH Certificates

Technical Conference delegates will receive their PDH (Professional Development Hours) certificate for attendance by email within 3-weeks following the conference. (5-day = 32.5 PDHs, 3-day = 19.5 PDHs).

Conference Proceedings

Printed volumes of the official Conference Proceedings may be ordered after the Conference by emailing customercare@asme. org or by calling 1-800-THE-ASME. All ASME Conference Proceedings are submitted for indexing to the Engineering index, which publishes COMPENDEX, SCOPUS, and a host of other indexing databases. Proceedings are also submitted to ISI for indexing in the Thomson Reuters Conference Proceedings Citation Index. Only presented papers are submitted.

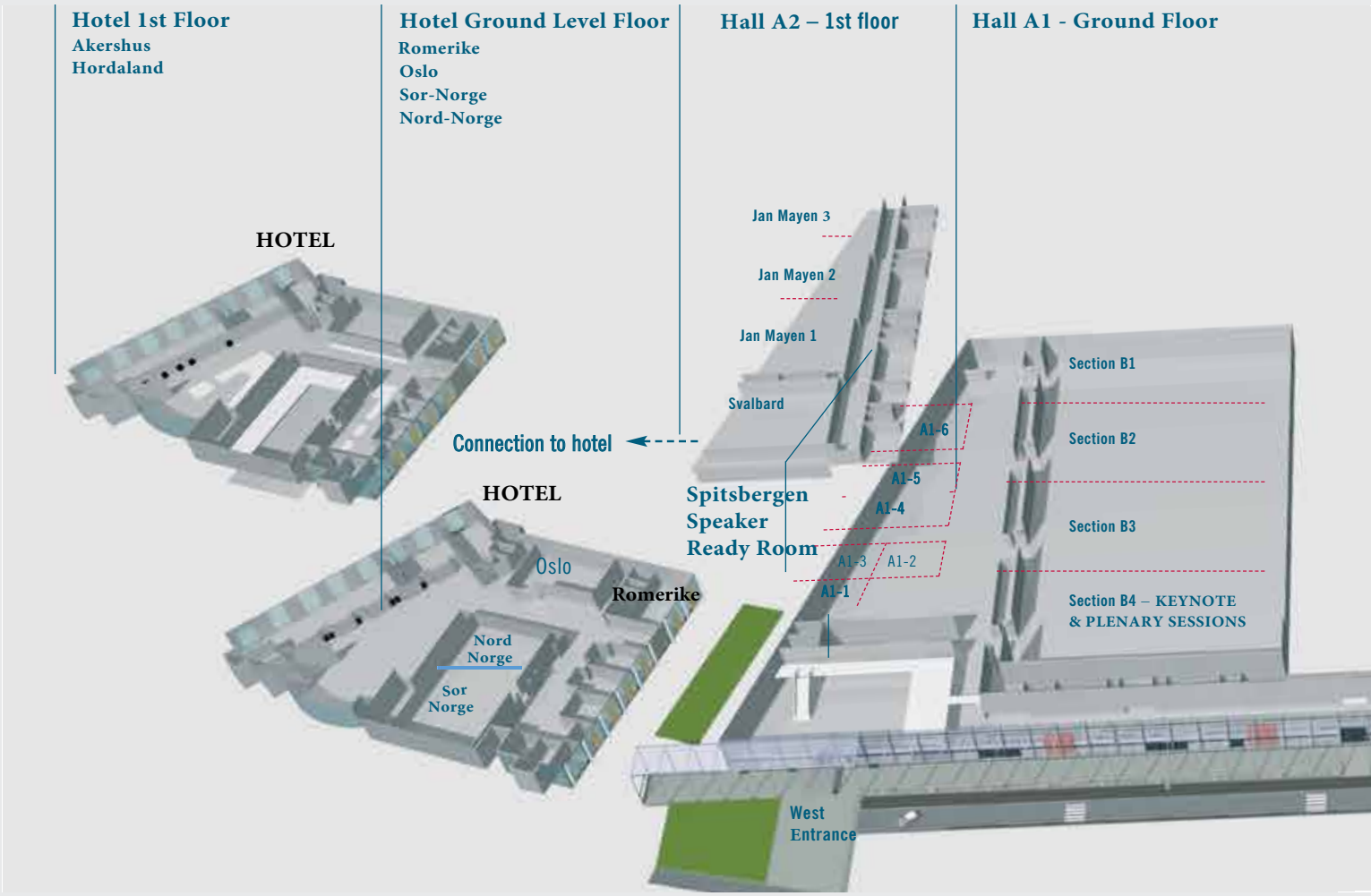
Technical Papers

The collection of the technical papers accepted for presentation and publication are posted online. Presentations, such as panels or posters, that do not have an accompanying paper are considered to be "Oral Presentation Only" and do not appear in the system. Please note that this is NOT the official proceedings of the Conference, which is published after the Conference and is also made available online on the ASME Digital Collection at http://asmedigitalcollection.asme.org. As such, papers that appear in the system may not be cited until after the official Proceedings have been published. Technical conference attendees may view accepted conference papers at the 2018 Paper Printing Station in Registration.

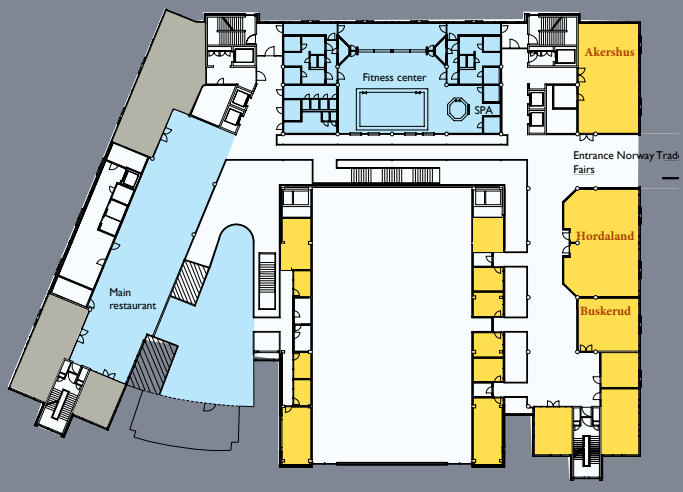
ASME Event App

Create your own personalized conference itinerary with the ASME Event Mobile App for the iPhone, iPad, Android, and Blackberry. Add technical sessions, committee meetings, special events, personal appointments, and tours to your schedule. For more information, and to download the mobile app, please go to
https://www.asme.org/events/turbo-expo/

ASME 2018 Turbo Expo Conference Meeting Rooms and Exhibit Location



Thon Hotel Ground Level



Thon Hotel 1st Floor

Hall C - Ground Floor

Hall C
Meeting Room

Session
Networking
Coffee

Monday Lunch

Friday Lunch

Hall D - Ground Floor

EXPO

Lunch: Tuesday - Thursday

Poster Session

Closing Ceremony

Press Office

Hall E - Ground Floor

SESSION ROOMS
E1 - E8

Event Room

E1 E2 E3 E4 E5 E6 E7 E8

Main promenade

East entrance

Technical Tours & Ancillary Events

Wednesday, June 13

Aker Solutions Tranby | www.akersolutions.com

Aker Solutions Tranby is located 25 km west of Oslo at Tranby. Building on nearly 200 years of engineering excellence rooted in Norway, Aker Solutions has grown into a global oil-services company that creates some of the most innovative technology in the industry. Its' oil and gas projects range from underwater installations the size of football fields to equipment that works in the deepest waters and most challenging environments.

Aker Solutions in 2014 streamlined its business to focus on two main segments, subsea and field design. Today it employs about 14,000 people in some 20 countries, spread through Africa, the Americas, Asia Pacific and Europe.

Aker Solutions Tranby is located 25 km west of Oslo at Tranby. Tranby is Aker Solutions' Oil and gas subsea pump production site established in 1975. 1bNOK invested in facility and new machinery last decade and is a specialized subsea manufacturing and testing plant. Tranby facilitates state of the art CNC cladding and machining centres, as well as test pits to facilitate both subsea pumps, XMTs (Christmas Trees) and WOS Work Over System testing. The company traces its origins back to a small mechanical workshop, named Akers Mekaniske Verksted, founded on the Aker River in Oslo, Norway, in 1841. In 1853, rival Kvaerner Brug was founded nearby and in the following decades, the two companies expanded in step with the industrial revolution.

During the Tour we present and guide you through the Technology Centre with work shop, machinery park and test facilities.

Schedule:
12:30 p.m. | Depart Norway Trade Fairs
1:30 p.m. | Arrive at Aker Solutions Tranby
3:00 p.m. | Depart Aker Solutions Tranby
4:00 p.m. | Arrive at Norway Trade Fairs

Monday, June 11

FSubsea, Oslo | www.fsubsea.com

Fuglesangs Subsea AS (FSubsea) is the subsea technology spin-off from Fuglesangs AS, a Norwegian family business established in 1916. We have more than 40 pumps operating in the deep seas world-wide for a variety of applications related to subsea process, unmanned platforms, offshore drilling and deep-sea excavation markets.

One of our key projects involves developing the world's first VSD-less and Barrier Fluid-less subsea process pumps, Omnirise®, in cooperation with several large Oil & Gas operators.

During the tour we will show you our Pump Technology Center, including our workshop, test center and subsea pit with cloud-based real-time analytics, condition and performance monitoring system. We will also show our Pump Energy Optimization "Albatross" program and our Mudrise and Searise subsea pumps, as well as key parts of our Omnirise system currently in production.

Light snacks and refreshments will be provided at reception during end of tour.

Schedule:
2:30 pm – 4:00 pm
Bus departs at 2:00 pm from the Norway Convention Center (arrive for bus loading at 1:45 pm)

ANCILLARY EVENTS

NUMECA's Lunch and Learn Session

Tuesday, June 12 at 12:30 PM
Norway Exhibition and Convention Centre, Hall C Meeting Room
(see page 50 for location)

You are invited to attend NUMECÀs Lunch & Learn Session. During this free lunch, our technical experts will provide you with a detailed overview of our brand new solutions for turbomachinery design and analysis.

SoftInWay's Lunch and Learn Session

Integrating In-House Simulation Tools with Commercial Products | Wednesday, June 13th at 12:00PM
Norway Exhibition and Convention Centre, VIP Center/Room in the Press Office (see page 50 for location)

During this seminar, one of SoftInWay's expert engineers will lead attendees through best practices for integrating and automating thermodynamic cycles, aerodynamic design, rotor dynamics, secondary system modeling, CAD and more using AxSTREAM®.

Tutorials of Basics & Joint Sessions

Tutorials of Basics

Aircraft Engine

WA-1-17, *Jan Mayen 2*, Basics of Gas Turbine Engines

Ceramics

WC-2-4 Part A and B, *Oslo*, Ceramic Matrix Composites: Tutorials Joint with Combustion, Fuels & Emissions and Manufacturing Materials & Metallurgy

Combustion, Fuels & Emissions

WA-4-39, *A1-2*, Alternative Fuels Fundamentals Joint with Coal, Biomass & Alternative Fuels

Coal, Biomass & Alternative Fuels

TA-3-4, *Nord-Norge*, Liquid Fuel Atomization and Combustion - Joint Session with Combustion, Fuels and Emissions Committee

ThA-3-6, Sør-Norge, The Challenges of Combustion Computational Fluid Dynamics for Industrial Gas Turbine Engines

Cycle Innovations

WB-6-12, *Hordaland*, Introduction to Dynamic Analysis and Modelling of Plant Systems

ThB-6-11, Hordaland, Introduction to Gas Turbine Conceptual Design and Technological Perspectives Joint with Aircraft Engine Committee

WC-7-2, Part A and B, Nord-Norge, Turbomachinery / Gas Turbines Education for the 21st Century. Representatives from the large gas turbine and turbomachinery companies will discuss the current and near future education needs of the mechanical and aerospace engineers considering the global changes occurring in the areas of turbomachinery and gas turbines.

Heat Transfer: Tutorials

MA-14-1, *A1-4 + A1-5*, Physics-Based Introduction to Vortex, Windage, Rothalpy, Mach Number, Choking, Normal Shock, and Entropy Map

MB-14-2, *A1-4 + A1-5*, Turbine Cooling Fundamentals

MC-14-3, *A1-4 + A1-5*, Conjugate Heat Transfer Methodologies for Gas Turbine Combustor Aerothermal Investigation Joint Tutorial with Combustion, Fuels and Emissions Committee

Industrial & Cogeneration

MC-23-6Part A and B, *Oslo*, Combustion & Emissions Joint with Combustion, Fuels & Emissions

TB-23-10, *Oslo*, New Frontiers and Challenges in Polygeneration Grids

WA-23-7, *Sør-Norge*, Gas Turbine Applications Involving Heavy Fuel Oils and Crude Oils Joint with Combustion, Fuels & Emissions

WC-23-8 Part A and Part B:, *Sør-Norge*, Gas Turbine Design Using Aerothermodynamic Analysis

ThC-23-9 Part A and B, *Akershus*, Design and Evaluation Considerations of Waste Heat Recovery Technologies

Microturbines, Turbochargers & Small Turbomachines

MA-26-1, *Oslo*, Oil-Free Bearing Systems

Oil & Gas Applications

TB-27-11, *Sør-Norge*, Compressor Dynamics

TD-27-13, *Sør-Norge*, Basics of Rotordynamics Instrumentation and Data Acquisition

WB-27-12, *Nord-Norge*, Industrial Gas Turbines-An Introduction

FA-27-10, *Sør-Norge*, Oil and Gas Applications

FB-27-9, *Sør-Norge*, Risk Assessment at LNG Plant

FC-27-14, *Sør-Norge*, Dry Gas Seals and Panels: Design, Operation, and Maintenance Techniques for Improved Reliability

Supercritical CO_2 Power Cycles

MA-38-10, *Akershus*, Fundamentals of Supercritical CO_2 Power Cycles

TB-38-13, *Akershus*, Materials for Supercritical CO_2 Power Cycles

WA-38-14, *Akershus*, Supercritical CO_2 Power Cycle Modeling and Fluid Properties

WC-38-12, *Akershus*, Heat Exchangers for Supercritical CO_2 Power Cycle Applications

ThB-38-11, *Akershus*, Turbo Machinery Design for Supercritical CO_2 Applications

Tutorials of Basics & Joint Sessions

Structures & Dynamics: Structural Mechanics, Vibration & Damping

TB-35-11, *E-7*, Introduction to Harmonic Balance and Application to Nonlinear Vibration Analysis

Structures & Dynamics: Probabilistic Methods

TC-32-4, *E-6*, Probabilistic Methods Fundamentals 1

ThD-32-5, *Event Room*, Probabilistic MethodsFundamentals 2

Structures & Dynamics: Rotordynamics

FA-33-8, *E-7*, Rotordynamics 101 - Theory, Vibration Monitoring, and Case Studies

Structures & Dynamics: Aerodynamic Excitation & Damping

FB-36-6, *Event Room*, Introduction to Turbomachinery Aeromechanics (No Equations)

Structures & Dynamics: Fatigue, Fracture & Life Prediction

FC-31-7, *Event Room*, Damage Tolerant Analysis in Turbomachinery

Joint Sessions

Coal, Biomass & Alternative Fuels with Manufacturing Materials & Metallurgy Joint with Ceramics

WC-3-5 Part A and B, *Jan Mayen 1,* Environmental Life Cycle Assessment (LCA) Approach to Design, Improve and Manufacture Gas Turbine/Engines for Alternative Fuel Flexibility

Heat Transfer: Internal Air Systems & Seals with Turbomachinery

TA-15-6, *A1-6*, Rim Seals 2

TB-15-7, *A1-6*, Rim Seals 3

WA-15-1, *A1-4 + A1-5*, Air System Pre-Swirl and Analysis

WB-15-5, *A1-4 + A1-5*, Rim Seals 1

WC-15-9Part A and B, A1-4 + A1-5, Shaft Seals and Lube Oil Systems

ThA-15-2, *A1-2,* Air System Components

ThB-15-4, *A1-2*, Brush, Leaf, and Labyrinth Seals

FA-15-3, *A1-6*, Labyrinth Seals

FB-15-8 Part A and Part B, A-2, Rotor Cavities

Heat Transfer: Combustors with Combustion, Fuels & Emissions

TC-17-1 Part A and B, *Jan Mayen 1*, Combustor Liner Heat Transfer

FA-17-2, *A1-4 + A1-5*, Combustor - Turbine Interaction

FC-17-3, *A1-6*, Combustor Heat Transfer

Manufacturing Materials & Metallurgy Joint with Ceramics

WB-24-1, *Svalbard,* Coatings for Gas Turbine Engines

Turbo Expo Focus Tracks

Three distinct focus tracks will shed light on high-potential areas within the framework of the existing technical committees:

- Maintenance, Repair and Overhaul in the light of Digitalization (MRO/Digital)
- Additive Manufacturing (AM)
- Pressure Gain Combustion (PGC)

These focus tracks feature Plenary Sessions (MRO/Digital and AM only), dedicated Technical Sessions as well as Panel and Tutorial Sessions given by renowned experts in the respective fields.

Additive Manufacturing			
Day	**Time**	**Session No. & Title, Paper No. & Title**	**Page in Program**
Mon	2:00 - 3:30 pm 4:00 - 5:30 pm	**Tutorial (24-11, 24-12):** Additive Manufacturing with Metals Part I *Tim Simpson, Penn State University*	75 , 84
Tue	8:00 - 9:30 am	**Papers (24-2):** Additive Manufacturing Properties **GT2018-75870** *Structure and Mechanical Properties of Laser Beam and Wide Gap Brazed Joints Produced Using Mar M247 - Amdry DF3 Powders* **GT2018-75978** *Investigating Discrepancies in Bending Fatigue Behavior of Additively Manufactured Titanium 6Al-4V* **GT2018-76831** *Torsional Response of Additively Manufactured Steel under Monotonic and Cyclic Conditions*	94
	9:30 – 10:00 am	**Papers (39-6):** Design Concepts **GT2018-76383** Investigation of the Dihedral Angle Effect on the Boundary Layer Development Using Special-Shaped Expansion Pipes	96
	10:15 - 11:10 am	**Plenary (50-2):** Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts *Michael Winter, Pratt & Whitney* *Masahito Kataoka, Mitsubishi-Hitachi Power Systems* *Markus Seibold, Siemens*	99
	11:15 am - 12:45 pm	**Papers (24-3):** Additive Manufacturing Products **GT2018-75430** Characterizing Static and Dynamic Mechanical Propertiesfor Additive Manufactured ULTEM 9085 Used to Construct FlowControl Devices for Turbomachinery Applications **GT2018-76686** Additive Manufacturing for the Manufacture of Gas Turbine Engine Components: Literature Review and Future Perspectives **GT2018-75548** Analysis of Parameters Influencing Build Accuracy of a SLM Printed Compressor Outlet Guide Vane	104
	2:00 – 3:30 pm	**Panel (24-17):** Additive Manufacturing for Aircraft Gas Turbines and Parts *Michael Winter, Pratt & Whitney* *Michael Gorelik, US FAA*	115
	4:00 – 5:30 pm	**Panel (24-18):** Additive Manufacturing for Industrial Gas Turbines and Parts *Vladimir Navrotsky, Siemens; Masahito Kataoka, MHPS; Massimiliano Cecconi, GE; Uwe Ruedel, Ansaldo Energia Switzerland*	123

Turbo Expo Focus Tracks

Day	Time	Session No. & Title, Paper No. & Title	Page in Program
Tue	8:00 – 10:00 am	**Papers (24-4):** Additive Manufacturing Equipment and Processes **GT2018-75119** Assessing the feasibility of micro-plasma technology for additive manufacturing **GT2018-75862** New Welding Material and Technologies for Repair and 3D Additive Manufacturing of Turbine Engine Components of High Gamma Prime Nickel Based Superalloys **GT2018-76614** Development and Material Characterization of an Additively Manufactured Nickel Alloy for Turbine Applications **GT2018-76924** Process Optimization of Wire based Laser Metal Deposition of Titanium	127
Wed	4:00 - 4:30 pm	**Papers (31-1 Part B)**: Crack Growth Modelling **GT2018-76465** Durability and damage tolerance assessment of additive manufactured compressor disk considering material defects distribution	153
	4:30 - 5:00 pm	**Papers (46-2):** Manufacturing Tolerances and Uncertainties **GT2018-77081** Additive manufacturing of honeycombs seals in gas turbine applications	147
	5:00 - 5:30 pm	**Papers (35-10 Part B):** Experimental Vibration Analysis **GT2018-76264** Comparison of Blade Tip Timing with Strain Gauge Data for Evaluation of Dynamic Characterization of Last Stage Blade with Interlocked Shroud for Steam Turbine	154
Thu	2:00 - 3:00 pm	**Papers (21-1):** Additive Manufacturing I **GT2018-75019** Experimental Study on Pressure Losses in Porous Materials **GT2018-76166** Experimental Investigation on Additively Manufactured Transpiration and Film Cooling Structures	175
	4:30 - 5:00 pm	**Papers (4-4 Part B):** Combustor Design & Development I **GT2018-75165** An assessment on the benefits of additive manufacturing regarding new swirler geometries for gas turbine burners	182
	4:00 - 5:30 pm	**Papers (21-2):** Additive Manufacturing II **GT2018-75429** Numerical Optimization, Characterization, and Experimental Investigation of Additively Manufactured Communicating Microchannels **GT2018-77287 E**ffect of Coolant Feed Direction on Additively Manufactured Film Cooling Holes **GT2018-77114** Adiabatic Film Cooling Effectiveness of a LAMFabricated Porous Leading Edge Segment of a Turbine Blade	183
Fri	8:00 – 8:30 am	**Papers (30-3):** Emerging Methods Application **GT2018-75904** The use of additive technologies to create lightweight parts for gas turbine engine compressors	194
	8:30 – 9:00 am	**Papers (35-8)** Vibration and Damping of Bladed Disks **GT2018-75977** Investigating Damping Performance of Laser Powder Bed Fused Components with Unique Internal Structures	195

Turbo Expo Focus Tracks

MRO / Digital			
Day	**Time**	**Session No. & Title, Paper No. & Title**	**Page in Program**
Mon	8:00 – 10:00 am	**Papers (5-11):** Topics in Diagnostics **GT2018-76108** Smart Health Monitoring Based on Digital Models for Centrifugal Pumps in Desalination Industry **GT2018-76101** Fault Diagnosis Method for Inter-shaft Bearings Based on Information Exergy and Random Forest **GT2018-75368** A Two-Layer Multi-Model Gas Path Fault Diagnosis Method **GT2018-75374** Analysis of Performance of a Twin-Shaft Gas Turbine during Hot-End Damage in the Gas Generator Turbine	69
	10:15 – 11:45 am	**Keynote Panel (50-1)**: MRO in the Light of Digitalization Zuo Zhi Zhao, Siemens, Russel Irving, GE Global Research, *Frode Abotness, Statoil, Pascal Decoussemaeker, GE,* *Shawn Gregg, Delta Air Lines*	70
	2:00 – 3:30 pm	**Papers (5-12):** Topics in Instrumentation **GT2018-76793** Near-wing multi-sensor diagnostics of jet engine Components **GT2018-76906** Engine-scalable Rotor Casing Convective Heat Flux Evaluation Using Inverse Heat Transfer Methods **GT2018-76657** Blade vibration monitoring in a low-pressure steam turbine	72
	4:00 – 5:30 pm	**Papers (5-12)**: Topics in Instrumentation **GT2018-76221** Towards An Improved Lifing Methodology For Thermocouple Probes Used In Gas Turbines **GT2018-75293** Wall temperature measurements in gas turbine combustors with thermographic phosphors **GT2018-77137** Real Time Gas Turbine Engine Particulate Ingestion Sensor for Particle Size and Composition	82
Tue	8:00 – 9:30 am	**Papers (5-2)**: Measurement Techniques for Structural Health Monitoring I **GT2018-75384** Automated Condition Evaluation of Hot-Gas Path Components of Jet Engines through Exhaust Jet Analysis **GT2018-76406** Measurement and evaluation of shaft torsional vibrations using shaft instantaneous angular velocity **GT2018-75224** Gas Turbine Bearing Wear Monitoring Method Based on Magnetic Plug Inductance Sensor	92
	9:30 – 10:00 am	**Papers (8-2):** Gas Turbine Analysis & Optimization GT2018-75030 Energy Innovation: A Focus on Power Generation Data Capture & Analytics in a Competitive Market	92
	11:45 am – 12:45 pm	**Papers (5-3):** Performance Monitoring and Fault Diagnostics of Gas Turbines I **GT2018-76961** Multi-Level Neural Network Based Gas Turbine Modeling **GT2018-75492** Fuzzy Analytic Hierarchy Process Evaluation Method of Gas Turbine Based on Health Degree	102

Turbo Expo Focus Tracks

Day	Time	Session No. & Title, Paper No. & Title	Page in Program
Wed	8:00 – 10:00 am	**Panel (5-14)** The Gas Turbine Life Cycle Through a Data Analytics Lens *Atul Kohli, Pratt & Whitney* *Sal DellaVilla, Strategic Power Systems* *Friedhelm Kappel, MTU Aero Engines AG* *Linn Cecilie Moholt, Statoil* *Rodolphe Parisot, AFI KLM E&M*	125
	8:00 – 8:30 am	**Papers (29-6):** General Design Aspects **GT2018-75066** Digitalization: Laser metal deposition – The future of spare parts and repairs for industrial steam turbines	128
	10:15 – 11:10 am	**Plenary (50-3):** The MRO Digital/Data Transformation Bernhard Krüger-Sprengel, Lufthansa Technik Jeff Benoit, PSM	132
	11:15 am – 12:45 pm	**Papers (5-4):** Data Analytics and reasoning for Smart MRO **GT2018-75267** Estimating Recoverable Performance Degradation Rates and Optimizing Maintenance Scheduling **GT2018-75286** Selecting Optimal Features for Cross-Fleet Analysis and Fault Diagnosis of Industrial Gas Turbines **GT2018-75540** Intelligent Reasoning for Gas Turbine Fault Isolation and Ambiguity Resolution	134
	2:00 – 3:30 pm 4:00 – 5:30 pm	**Tutorial (5-15 and 5-16):** Constructing a Digital Twin *Russel Irving, GE GRC*	148 & 156
Thu	8:00 – 10:00 am	**Papers (24-6):** Component Degradation & Failure Analysis **GT2018-75078** Isothermal Oxidation of RenE N5 at 1150 deg. C **GT2018-75259** Effect of Pre-Creep Strain on High Cycle Fatigue Life of Ti 834 **GT2018-76902** Acceptability of Defects under Combined Cycle Fatigue for a Precipitation Hardened Steel	162
	10:45 am – 11:45 pm	**Papers (1-14):** Engine Maintenance and On-wing Monitoring of Deterioration **GT2018-76496** Measurement Quality Assessment of an On-Wing Engine Thrust Measurement System **GT2018-75558** A Top-Down Approach for Quantifying the Contribution of High Pressure Compressor Deterioration Mechanisms to the Performance Deterioration of Turbofan Engines **GT2018-75798** Foreign Object Damage Diagnosis of Aero-Engine Compressor Based on Damping Averaging Built-in Matrix Method	166
	4:00 - 5:30	Papers (27-6): MRO/Digital GT2018-76583 Digital Compressor Analytics GT2018-76849 Use of operating parameters, digital replicas and models for condition monitoring and improved equipment health GT2018-75876 Demonstration of Bleed Air Recirculation System to Improve Part Load Efficiency of Solar Mars 100 DLE Industrial Gas Turbine	185

Turbo Expo Focus Tracks

Day	Time	Session No. & Title, Paper No. & Title	Page in Program
Fri	8:00 – 8:30 am	**Papers (35-8):** Vibration and Damping of Bladed Disks **GT2018-77025** Optimal Placement and Sizing of Piezoelectric Material for Multiple-Mode Vibration Reduction	195
	9:30 – 10:00 am	**Papers (39-04):** Manufacturing & Deterioration Effects **GT2018-76644** Full High Pressure Compressor Investigations to determine Aerodynamic Changes due to Deterioration	185
	10:45 – 11:15 am	**Papers (30-1):** Developments in Optimization Methods and Parameter Studies **GT2018-75685** Using Robust Design Methods For the Fir Tree Optimization Problem	203
	11:15 - 11:45 am	**Papers (32-3):** Probabilistic Method Developments **GT2018-**75854 Application of Surrogate Models and Probabilistic Design Methodology to Assess Creep Growth Limit of an Uncooled Turbine Blade	192
	11:15 am – 12:15 pm	**Papers (24-8):** Repairs and Coatings **GT2018-75395** Linking MRO to Prognosis based Health Management through Physics-of Failures Understanding **GT2018-76364** Technology-based Re-contouring of Blade Integrated Disks After Weld Repair	201
	2:00 – 2:30 pm	**Papers (29-5):** Blade Vibrational Aspects **GT2018-76565** On Possibilities Of Using Relative Shaft Vibration Signals For Rotating Blades Monitoring	208
	2:30 – 3:00 pm	**Papers (1-2):** Modeling, Simulation and Validation **GT2018-75719** Integration of 3D-CFD component simulation in overall engine performance analysis for engine condition monitoring purposes	205
PGC			
Day	**Time**	**Session No. & Title, Paper No. & Title**	**Page in Program**
Thu	8:00 – 10:00 am	**Tutorial (4-41):** Pressure Gain Combustion *Dan Paxson, NASA*	159
	10:15 am – 12:15 pm	**Papers (4-7):** Novel Combustor Concept II **GT2018-75878** Detailed Chemical Kinetics Based Simulation of Detonation-containing Flows **GT2018-77258** Experimental Analysis of Wave Propagation in a Methane-Fueled Rotating Detonation Combustor **GT2018-76842** Numerical Study On NOx Reduction In Pulse Detonation Combustion By Using Steam Injection Decoupled From Detonation Development **GT2018-75338 A** New Spin on Small Scale Combustor Geometry	168
	2:00 – 3:30 pm 4:00 – 4:30 pm	**Panel (4-35):** Pressure Gain Combustion *Richard Dennis, US DOE* *Chris Brophy, Naval Postgraduate School* *Scott Claflin, Aerojet-Rocketdyne* *Bernard Robis, Safran Aircraft* *Anthony Dean, GE*	174

Turbo Expo Session Schedule

Session ID Key

The Session ID is comprised of the day code and the original session number from the conference web tool.

- Consult pages 56 - 205 for the detailed Technical Conference session schedule.
- All sessions are conducted in English.
- Sessions are held at the Norway Trade Fairs Convention Center and at the THON Hotel Arena (adjacent to the convention center).

MA - Monday, June 11	**8:00 - 10:00 a.m.**
MB - Monday, June 11	**2:00 - 3:30 p.m.**
MC - Monday, June 11	**4:00 – 5:30 p.m.**
TA - Tuesday, June 12	**8:00 - 10:00 a.m.**
TB - Tuesday, June 12	**11:15 a.m. - 12:45 p.m.**
TC - Tuesday, June 12	**2:00 - 3:30 p.m.**
TD - Tuesday, June 12	**4:00 – 5:30 p.m.**
WA - Wednesday, June 13	**8:00 - 10:00 a.m.**
WB - Wednesday, June 13	**11:15 a.m. - 12:45 p.m.**
WC - Wednesday, June 13	**2:00 - 3:30 p.m.**
WD - Wednesday, June 13	**4:00 – 5:30 p.m.**
ThA - Thursday, June 14	**8:00 - 10:00 a.m.**
ThB - Thursday, June 14	**10:15 a.m. - 12:15 p.m.**
ThC - Thursday, June 14	**2:00 - 3:30 p.m.**
ThD - Thursday, June 14	**4:00 – 5:30 p.m.**
FA - Friday, June 15	**8:00 - 10:00 a.m.**
FB - Friday, June 15	**10:15 AM - 12:45 p.m.**
FC - Friday, June 15	**2:00 - 3:30 p.m.**

Turbo Expo Technical Conference Program Information

Sessions are detailed vertically. The top rows contain general information, and the bottom rows list the organizer and paper details. Presentation times are noted to the left.

Column Detail

	COMMITTEE/TRACK NAME
	Session Title
	Session Type • Room • Session ID
	Session Chair, Affiliation **Session Co-Chair(s)**, Affiliation(s)
PRESENTATION TIME	ASME Paper Number **Paper Title** ***Author(s)***, *Affiliation(s)*

Example

	CYCLE INNOVATIONS
	Cycle Innovations in Small Scale Applications I
	Technical Session • Hordaland • MA-6-02
	Session Chair: **Morgan Hendry**, SSS Clutch Session Co-Chair: **Ningbo Zhao**, Harbin Engineering University
8:00	GT2018:75323 **Mission Analysis and Operational Optimization of Adaptive Cycle Microturbofan Engine in Surveillance and Firefighting Scenarios** ***Michael Palman, Technion -*** *Israel Institute of Technology;* ***Boris Leizeronok,*** *Technion - IIT;* ***Beni Cukurel, Technion -*** *Israel Institute of Technology*
8:30	GT2018:75664 **A highly flexible approach on the steady-state analysis of innovative micro gas turbine cycles** ***Thomas Krummrein, Martin Henke, Peter Kutne,*** *German Aerospace Center (DLR)*
9:00	GT2018:75901 **Performance improvement of a micro gas turbine adopting exhaust gas recirculation for CO_2 capture by integration with liquid air energy storage** ***Min Jae Kim, Dong Hyeok Won, Tong-seop Kim,*** *Inha University*
9:30	GT2018:76377 **Numerical Investigation Of An Inverted Brayton Cycle Micro Gas Turbine Based On Experimnetal Data** ***Eleni Agelidou, Martin Henke, Thomas Monz, Manfred Aigner,*** *German Aerospace Centre*

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	What is That Hole in the Back of The Airplane? - APU Tutorial Session	**Combustion Fundamentals**	**Combustion Dynamics: High Frequency Instabilities**
	Tutorial Session • Jan Mayen 2 • MA-1-11	**Tutorial Session • A1-1 • MA-4-37**	**Technical Session • Jan Mayen 3 • MA-4-19**
	Session Chair: **Bruce Bouldin,** Honeywell Aerospace Session Co-Chair: **Eric Shepard,** Honeywell	Session Organizer: **Michael Klassen**, Combustion Science & Engrg Session Co-Chair(s): **Tim Lieuwen**, Georgia Institute of Technology	Session Organizer: **Gilles Bourque,** Siemens Canada Session Co-Chair(s): **Eric L. Petersen,** Texas A&M University; **Marc Furi,** Siemens Canada Limited; **A John Moran**, Loughborough University
8:00	GT2018:77636 Introduction to APUs and basic considerations Eric Shepard, Honeywell GT2018:77637 Installation considerations Bruce Bouldin, Honeywell Aerospace	GT2018:77492 **Combustion Fundamentals** ***Michael Klassen,*** *Combustion Science & Engrg* GT2018:77376 **Combustion Fundamentals** Michael Klassen, Combustion Science & Engrg; ***Tim Lieuwen***, *Georgia Institute of Technology*	GT2018:77034 **Numerical Design of a Novel Reheat Combustor Experiment for the Analysis of High-Frequency Flame Dynamics** ***Pedro Romero Vega,*** *Chair of Thermodynamics - Technical University of Munich;* ***Frederik M. Berger,*** *Technical University of Munich (TUM), Chair of Thermodynamics;* ***Tobias Hummel,*** *Technische Universitaet Muenchen;* ***Bruno Schuermans,*** *GE (Switzerland) GmbH;* ***Thomas Sattelmayer,*** *Technical Univ Munich*
8:30			GT2018:77101 **A Novel Reheat Combustor Experiment for the Analysis of High-Frequency Flame Dynamics - Concept and Experimental Validation** ***Frederik M. Berger, Tobias Hummel, Pedro Romero Vega, Thomas Sattelmayer,*** *Technical University of Munich;* ***Bruno Schuermans,*** *GE (Switzerland) GmbH*
9:00			GT2018:75509 **Analysis Technique To Determine The Underlying Wave Structure Of Combustion Instabilities From Surface Mounted High Response Static Pressure Sensors** ***Alan Hale, Wesley Cothran,*** *National Aerospace Solutions;* ***Kevin Sabo,*** *Massachusetts Institute of Technology*
9:30			GT2018:75689 **Experimental Characterisation Of Acoustic Damping Generated By Perforated Screens At High Frequencies** ***Martin Jurisch,*** *H.F.I. TU Berlin;* ***Martin Szeponik,*** *Technische Universitaet Berlin;* ***Christian Oliver Paschereit,*** *H.F.I TU Berlin;* ***Patrick R. Flohr,*** *Siemens AG;* ***Michael Huth,*** *Siemens;* ***Lukasz Panek,*** *Siemens;* ***Jonas P. Moeck,*** *TUB/NTNU*

TUTORIAL

TUTORIAL

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	CYCLE INNOVATIONS	FANS & BLOWERS	HEAT TRANSFER: CONJUGATE HEAT TRANSFER
	Cycle Innovations in Small Scale Applications I	**Fans and Blowers: Experimental Methods**	**Conjugate Heat Transfer II**
	Technical Session • Hordaland • MA-6-02	**Technical Session • A1-2 • MA-9-02**	**Technical Session • A1-3 • MA-10-02**
	Session Organizer: **Ward De Paepe,** University of Mons Session Co-Chair(s): **Jafar Alzaili**, City, University of London	Session Organizer: **Johan Van der Spuy,** Stellenbosch University Session Co-Chair(s): **Konrad Bamberger**, University of Siegen	Session Organizer: **Hyung Hee Cho,** Yonsei University Session Co-Chair(s): **Gregory Laskowski,** GE Aviation
8:00	GT2018:75323 **Mission Analysis and Operational Optimization of Adaptive Cycle Microturbofan Engine in Surveillance and Firefighting Scenarios** ***Michael Palman, Technion -*** *Israel Institute of Technology;* ***Boris Leizeronok,*** *Technion - IIT;* ***Beni Cukurel, Technion -*** *Israel Institute of Technology*	GT2018:75369 **Optimised Test Rig for Measurements of Aerodynamic and Aeroacoustic Performance of Leading Edge Serrations in Low-Speed Fan Application** ***Till M. Biedermann,*** *University of Applied Sciences Dusseldorf;* ***Frank Kameier,*** *HS Dusseldorf (ISAVE);* ***Christian Oliver Paschereit,*** *H.F.I TU Berlin*	GT2018:75669 **Application of Conjugate Heat Transfer Analysis to Improvement of Cooled Turbine Vane and Blade for Industrial Gas Turbine** ***Takeshi Horiuchi, Tomoki Taniguchi, Ryozo Tanaka, Masanori Ryu, Masahide Kazari,*** *Kawasaki Heavy Industries, Ltd.*
8:30	GT2018:75664 **A highly flexible approach on the steady-state analysis of innovative micro gas turbine cycles** ***Thomas Krummrein, Martin Henke, Peter Kutne,*** *German Aerospace Center (DLR)*	GT2018:75778 **Combined Aerodynamic and Phased Array Microphone Studies on Basic Models of Low-Speed Axial Fan Blade Sections** ***Esztella Balla, Janos Vad,*** *Budapest University of Technology and Economics*	GT2018:75991 **EXPERIMENTAL INVESTIGATION ON THE FLOW AND HEAT TRANSFER OF AN AIR-AIR PRIMARY SURFACE HEAT EXCHANGER** ***Wei Dong, Shengbao Zhang, Zhiqiang Guo,*** *Shanghai Jiao Tong University;* ***Xiao Yu, Shenyang*** *Engine Design and Research Institute*
9:00	GT2018:75901 **Performance improvement of a micro gas turbine adopting exhaust gas recirculation for CO_2 capture by integration with liquid air energy storage** ***Min Jae Kim, Dong Hyeok Won, Tong-seop Kim,*** *Inha University*	GT2018:75964 **Performance Testing of an Axial Flow Fan Designed for Air-Cooled Heat Exchanger Applications** ***Michael Wilkinson, Johan Van der Spuy, Theodor Von Backstrom,*** *Stellenbosch University*	GT2018:76969 **ENHANCEMENT OF IMPINGEMENT HEAT TRANSFER WITH THE CROSSFLOW NORMAL TO RIBS AND PINS BETWEEN EACH ROW OF HOLES** ***Abubakar M. El-Jummah,*** *University of Maiduguri;* ***Gordon E. Andrews,*** *Univeristy of Leeds;* ***John E. J. Staggs,*** *University of Leeds*
9:30	GT2018:76377 **Numerical Investigation Of An Inverted Brayton Cycle Micro Gas Turbine Based On Experimnetal Data** ***Eleni Agelidou, Martin Henke, Thomas Monz, Manfred Aigner,*** *German Aerospace Centre*	GT2018:76909 **EXPERIMENTAL INVESTIGATION OF THE EFFECT OF REYNOLDS NUMBER ON THE EFFICIENCY OF SINGLE-STAGE AXIAL FANS** ***Massimo Masi, Stefano Castegnaro, Andrea Lazzaretto,*** *University of Padova*	GT2018:77230 **On improving full-coverage effusion cooling efficiency by varying cooling arrangements and wall thickness in double wall cooling application** ***Weihong LI, Xunfeng Lu, XUEYING LI, Jing Ren, Hongde Jiang,*** *Tsinghua University*

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	HEAT TRANSFER: NUMERICAL INTERNAL COOLING	HEAT TRANSFER: TUTORIALS	MANUFACTURING MATERIALS & METALLURGY
	Passages with Turbulators and Bends	**Physics-Based Introduction to Vortex, Windage, Rothalpy, Mach Number, Choking, Normal Shock, and Entropy Map**	**Advanced Turbomachinery Manufacturing**
	Technical Session • A1-6 • MA-11-01	**Tutorial Session • A1-4 + A1-5 • MA-14-01**	**Tutorial Session • Svalbard • MA-24-13**
	Session Organizer: **James Heidmann,** NASA Glenn Research Ctr Session Co-Chair(s): **Ting Wang**, University Of New Orleans	Session Organizer: **Andrew Nix**, West Virginia University Session Co-Chair(s):	Session Organizer: **Sascha Gierlings,** Fraunhofer IPT
8:00	GT2018:75530 **Steady RANS of Flow and Heat Transfer in a Smooth and Pin-Finned U-Duct with a Trapezoidal Cross Section** ***Kenny Hu, Xingkai Chi, Tom Shih,*** *Purdue University;* ***Minking Chyu****, Univ Of Pittsburgh;* ***Michael Crawford****, University of Texas*	GT2018:75001 **Physics-Based Introduction to Vortex, Windage, Rothalpy, Mach Number, Choking, Normal Shock, and Entropy Map** ***Bijay K. Sultanian,*** *Takaniki Communications, LLC*	GT2018-77464 **Advanced Turbomachinery Manufacturing** ***Sascha Gierlings, Daniel Heinen Fraunhofer*** *IPT;* ***Matthias Brockmann, Benjamin Doebbeler, Robin J. Day****, WZL RWTH Aachen;* ***David Welling****, Makino Europe*
8:30	GT2018:75535 **Large-Eddy and RANS Simulations of Heat Transfer in a U-Duct with a High Aspect Ratio Trapezoidal Cross Section** ***Kenny Hu, Tom Shih,*** *Purdue University*	**T U T O R I A L**	**T U T O R I A L**
9:00	GT2018:75929 **A NUMERICAL STUDY OF HEAT TRANSFER AND FLOW STRUCTURE IN CHANNELS WITH MINIATURE V RIB-DIMPLE HYBRID STRUCTURE ON ONE WALL** ***Peng Zhang, Yu Rao, Yanlin Li,*** *ShangHaiJiaoTong University*		
9:30	GT2018:75606 **The Counteractive Flow in a Narrow Straight Channel with Sidewall Bleeding Slots** ***Lu Qiu, Yanan Chen, Hongwu Deng, Jianqin Zhu,*** *Beijing Univerisity of Aeronautics and Astronautics*		

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	MARINE	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	OIL & GAS APPLICATIONS
	Numerical Analysis and Performance Simulation	**Oil-Free Bearing Systems**	**Performance and Design**
	Technical Session • E-5 • MA-25-04	**Tutorial Session • Oslo • MA-26-01**	**Technical Session • Sør-Norge• MA-27-08**
	Session Organizer: **Kenneth Braccio,** Advanced Turbine Services Session Co-Chair(s): **Thomai Gastopoulos,** Naval Surface Warfare Center Philadelphia Division	Session Organizer: **Thomas Chirathadam,** Bearings Plus, Waukesha Bearings Session Co-Chair(s): **Keun Ryu**, Hanyang University	Session Organizer: **Mauro Venturini,** Università Degli Studi Di Ferrara Session Co-Chair(s): **George Orme**, Berkshire Hathaway Specialty Insurance
8:00	GT2018:75516 **Numerical simulation of ITD flows in the presence of HP blade and LP vane** ***Jie Gao, Xuezheng Liu, Weiliang Fu, Fusheng Meng, Guoqiang Yue, Qun Zheng,*** *Harbin Engineering University;* ***Weiyan Xiao,*** *Harbin Marine Boiler and Turbine Research Institute*	GT2018:77512 **Introduction to Foil Bearings** ***Daniel Lubell,*** *Oil-Free Machinery, LLC* GT2018:77513 **Foil Bearings in Gas Turbines** ***Daniel Lubell,*** *Oil-Free Machinery, LLC* GT2018:77514 **Practical Performance of Foil Bearings** ***Keun Ryu,*** *Hanyang University* GT2018:77515 **Introduction to Rigid Gas Bearings** ***Keun Ryu,*** *Hanyang University*	GT2018:75020 **A Method and Apparatus for Direct Enthalpy Rise Measurement for Gas Compression** ***Klaus Brun, Sarah Simons, Kelsi Katcher, Ryan Cater, Brandon Ridens,*** *Southwest Research Institute;* ***Rainer Kurz,*** *Solar Turbines*
8:30	GT2018:75981 **Study on the Performance Variation of Compressor under Salt Fog Scale** ***Haiou Sun, Lisong Wang, Lei Wan, Feng Qu,*** *Harbin Engineering University*	**T U T O R I A L**	GT2018:75694 **Experimental and numerical investigation on Gas Turbine package scale model** ***Gabriele Lucherini, Stefano Minotti, Giacomo Ragni, Francesco Bologna,*** *Baker Hughes a Ge Company*
9:00	GT2018:76029 **Simulation Study on the Work Characteristics of Combined Diesel-Electric and Gas Turbine (CODLAG)** ***Zhitao Wang, Jian Li, Tielei Li, Weitian Wang, Shuying Li,*** *Harbin Engineering University*		GT2018:77006 **Design, Modeling, and Implementation of an Electrically-Driven Seal Gas Booster** ***Sean Garceau, John Bowen,*** *Solar Turbines*
9:30	GT2018:76617 **Investigation of Turbine Aerodynamic Optimization Design System for Marine Gas Turbines** ***Xiying Niu, Feng Lin, Weiyan Xiao, Guoqiang Li, Chen Liang,*** *Harbin Marine Boiler and Turbine Research Institute*		GT2018:77016 **The Comparison of Aerodynamic Performance Data Acquired from Thermal Measurements and a Torquemeter on a Compressor Impeller** ***Natalie Smith, Timothy Allison, Jason Wilkes,*** *Southwest Research Institute;* ***Christopher Clarke,Michael Cave,*** *Solar Turbines, Inc.*

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	STEAM TURBINES	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS
	Heat Transfer & Thermal Aspects	**Integrity of Engine Components (1)**	**Probabilistic Method Developments**
	Technical Session • Romerike • MA-29-04	**Technical Session • E-6 • MA-31-04**	**Technical Session • E-8 • MA-32-02**
	Session Organizer: **Monika Topel,** KTH Royal Institute of Technology Session Co-Chair(s): **Armin de Lazzer**, Siemens AG; **Klaus Helbig**, GE Germany	Session Organizer: **Chris Hulme,** GE Switzerland Session Co-Chair(s): **Jaroslaw Szwedowicz**, Siemens Schweiz AG	Session Organizer: **Jeffrey M. Brown,** US Air Force Research Laboratory Session Co-Chair(s): **Liping Wang**, GE Corporate Res & Develop
8:00	GT2018:75343 **Steam Flow and Heat Transfer in the Intermediate Pressure Cylinder of the Ultra-supercritical Steam Turbine** ***Chong Sun, Xiaocheng Zhu, Zhaohui Du,*** *Shanghai JiaoTong University;* ***Daiwei Zhou,*** *Shanghai Turbine Works Co. Ltd; Shanghai Jiao Tong University*	GT2018:75731 **Some aspects of operated blades HCF analysis. Rejuvenation and life estimation** ***Sergey Ivanov, Maxim Guralnik,*** *JSC "REPH";* ***Alexander Rybnikov,*** *Scientific and Development Association for the Research and Design of Power Equipment (NPO CKTI)*	GT2018:75759 **Adjoint Method to Calculate the Shape Gradients of Failure Probabilities for Turbomachinery Components** ***Hanno Gottschalk,*** *Universitat Wuppertal;* ***Mohamed Saadi, Onur T. Doganay, Kathrin Klamroth,*** *Bergische Universitat Wuppertal;* ***Sebastian Schmitz,*** *Siemens* AG
8:30	GT2018:75926 **Unsteady Conjugate Heat Transfer Investigation of a Multistage Steam Turbine in Warm-Keeping Operation with Hot Air** ***Piotr Luczynski, Dennis Tobben, Manfred Wirsum,****RWTH Aachen University;* ***Klaus Helbig, Wolfgang Mohr,*** *GE Germany*	GT2018:76848 **Blade Fissure Determination by Means of Blade-tip Timing System** ***Alexander Stepanov, Victor Mileshin, VICTOR Fateev,*** *Central Institute of Aviation Motors*	GT2018:75807 **Using Statistical Calibration for Model Verification and Validation, Diagnosis of Model Inadequacy, and Improving Simulation Accuracy** ***Kevin OFlaherty, Zach Graves, Mark Andrews, Lie Xiong,*** *SmartUQ*
9:00	GT2018:76091 **Analytical Heat Transfer Correlations for a Multistage Steam Turbine in Warm-Keeping Operation with Air** ***Dennis Tobben, Adrian Hellmig, Piotr Luczynski, Manfred Wirsum,*** *RWTH Aachen University;* ***Wolfgang Mohr,*** *GE Power;* ***Klaus Helbig,*** *GE Germany*	GT2018:76925 **Extending the Life of F-Class Gas Turbine Rotors** ***Scott Keller,*** *Power Systems Mfg., LLC;* ***David Day,*** *PSM - Ansaldo Energia Group*	GT2018:77007 **A Gaussian Process Modeling Approach For Fast Robust Design With Uncertain Inputs** ***Kevin Ryan, Sayan Ghosh,*** *General Electric Global Research Center;* ***Jesper Kristensen, You Ling, Isaac Asher,*** *General Electric Co;* ***Liping Wang,*** *GE Corporate Res & Develop*
9:30	GT2018:76252 **Experimental Investigation on Heat-up and Cool-down Procedure of a Steam Turbine Valve Casing** ***SIHUA XU, Jin He, Lei Xiao, Zhiqiang Hu, YueYue Li,*** *Shanghai Electric Power Generation Equipment Co.*	GT2018:76549 **Incremental modeling of rotor lifetime consumption during gas turbine operation** ***Meisam Sistaninia, Torsten Winge, Diego Ugel,*** *Ansaldo Energia Switzerland Ltd*	

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL $_{CO2}$ POWER CYCLES	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION
	Mistuning I	**Fundamentals of Supercritical CO2 Power Cycles**	**Multidisciplinary Optimization and Sensitivity Analysis (fluid, structure)**
	Technical Session • E-7 • MA-35-01	**Tutorial Session • Akershus • MA-38-10**	**Technical Session • E-4 • MA-46-08**
	Session Organizer: **Luigi Carassale**, University of Genova Session Co-Chair(s): **Christoph W. Schwingshackl,** Imperial College London	Session Organizer: **Jason Wilkes,** Southwest Research Institute	Session Organizer: **Michel Van Rooij,** Netherlands Aerospace Centre (NLR) Session Co-Chair(s): **David Wittrock**, German Aerospace Center (DLR)
8:00	GT2018:75382 **Mistuning Identification Approach with Focus on High-Speed Centrifugal Compressors** ***Robby Weber, Arnold Kuehhorn**, Brandenburg University of Technology*	GT2018:77358 **Fundamentals of Supercritical CO2 Power Cycles** ***Jason Wilkes, Aaron Rimpel**, Southwest Research Institute*	GT2018:75192 **Design Optimization of Splitter Blades for Rocket Engine Turbopumps** ***Francesco Torre, Claudio Lettieri, Matteo Pini**, Delft University of Technology; **Shinichi Konno**, **Yutaka Kawata**, Osaka Institute of Technology*
8:30	GT2018:75563 **Parametric Reduced Order Models for Bladed Disks with Mistuning and Varying Operational Speed** ***Eric Kurstak, Ryan Wilber, Kiran D'Souza**, The Ohio State University*	**T U T O R I A L**	GT2018:75542 **A Sensitivity Based Heuristic For Optimal Blade Arrangement In A Linear Mistuned Rotor** ***Mainak Mitra, Alparslan Emrah Bayrak, Bogdan Epureanu**, University of Michigan; **Stefano Zucca**, Politecnico Di Torino - DIMEAS*
9:00	GT2018:75666 **An Acoustic Travelling Wave System for the Analysis of Blisk Mistuning** ***Joshua J. Grant, Evan O. Smith, Jouke HS de Baar**, University of New South Wales Canberra; **Mitchell R. Cosmo, Jianfu F. Hou**, Defence Science and Technology Group*		GT2018:76226 **Influence of Turbocharger Turbine Blade Geometry on Vibratory Blade Stresses** ***Pavan Naik, Bernhard Lehmayr, Stefan Homeier, Michael Klaus**, Continental Automotive GmbH; **Damian Vogt**, University of Stuttgart*
9:30	GT2018:76455 **A MISTUNED FORCED RESPONSE ANALYSIS OF AN EMBEDDED COMPRESSOR BLISK USING A REDUCED ORDER MODEL** ***Mauricio Gutierrez**, KTH Royal Institute of Technology; **Paul Petrie-Repa**r, Department of Energy Technology, KTH; **Robert Kielb,** Duke University; **Nicole Key**, Purdue Univ*		GT2018:76474 **Aeroelastic Optimization of an Industrial Compressor Rotor Blade Geometry** ***Federico Vanti, Lorenzo Pinelli, Andrea Arnone**, University Of Florence; **Andrea Schneider**, **Pio Astrua**, **Enrico Puppo**, Ansaldo Energia S.p.A.*

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Centrifugal Compressors: Multistage & Pumps	**Unsteady Flows in Compressors I**	**Unsteady Flows in Turbines III**
	Technical Session • E-2 • MA-44-07	**Technical Session • E-3 • MA-45-01**	**Technical Session • E-1 • MA-45-04**
	Session Organizer: **Michele Marconcini,** University of Florence Session Co-Chair(s): **Roberto Pacciani**, University Of Florence	Session Organizer: **Roy Fulayter,** Rolls-Royce Corporation Session Co-Chair(s):	Session Organizer: **John Clark**, AFRL/RQTT Session Co-Chair(s): **Thomas Praisner**, Pratt And Whitney
8:00	GT2018:76400 **Optimization of Fuel Two-Stage Screw Centrifugal Pump of Rocket Powerful Turbopump Unit** ***Vasilii Zubanov**, **Andrei Volkov**, **Valeriy Matveev**, **Grigorii Popov**, **Oleg Baturin**,* *Samara National Research University*	GT2018:76055 **Experimental investigation of the unsteady tip clearance flow in a low-speed axial contra-rotating compressor** ***Shaoyuan Yue**, **Yangang Wang**, **Liguo Wei**, **Hao Wang**, **Shuanghou Deng**,* *Northwestern Polytechnical University*	GT2018:76725 **On the Influence of an Acoustically Optimized Turbine Exit Casing onto the Unsteady Flow Field Downstream of a Low Pressure Turbine Rotor** ***Loris Simonassi**, **Manuel Zenz**, **Stefan Zerobin**, **Franz Heitmeir**, **Andreas Marn**,* *Graz University of Technology;* ***Thorsten Selic**,* *Elin Motoren*
8:30	GT2018:76430 **Critical suction peformance test of turbopump assembly for a liquid rocket engine** ***Hang Gi Lee**, **Juhyun Shin**, **Sukhwan Yoon**, **Dae-Jin Kim**, **Jun Hwan Bae**, **Chang Ho Choi**,* *Korea Aerospace Research Institute*	GT2018:76258 **Circumferential mode analysis of axial compressor tip flow using Fourier transform and Proper orthogonal decomposition** ***Dan YAO**, **Jie Tian**, **Yadong Wu**, **HUA OUYANG**,* *Shanghai Jiao Tong University*	GT2018:76802 **On The Periodically Unsteady Interaction Of Wakes, Secondary Flow Development And Boundary Layer Flow In An Annular LPT Cascade. Part 1 — Experimental Investigation** ***Martin Sinkwitz**, **Benjamin Winhart**, **David Engelmann**, **Francesca di Mare**,* *Ruhr-Universitaet Bochum;* ***Ronald Mailach**,* *Technische Universität Dresden*
9:00	GT2018:76783 **Investigation of aerodynamic effects in stator components of multistage centrifugal compressors** ***Bastian Dolle**, **Dieter Brillert**, **Hans Josef Dohmen**, **Friedrich-karl Benra**,* *Univ of Duisburg-essen*	GT2018:76373 **Prediction of Unsteady Tip Leakage Flow of a Transonic Compressor Rotor by Reynolds-Stress-Constrained Large Eddy Simulation** ***Yueqing Zhuang**, **Hui Liu**,* *AECC Commercial Aircraft Engine Co., Ltd*	GT2018:76873 **On the periodically unsteady interaction of wakes , secondary flow development and boundary layer flow in an annular LPT cascade. Part 2 - numerical investigation** ***Benjamin Winhart**, **Martin Sinkwitz**, **David Engelmann**, **Francesca di Mare**,* *Ruhr-Universitaet Bochum;* ***Ronald Mailach**,* *Technische Universität Dresden*
9:30	GT2018:77015 **A Numerical Analysis of the Effects of Liquid Carryover on the Performance of a Two-Stage Centrifugal Compressor** ***Chaitanya V. Halbe**, **William Cousins**,* *United Technologies Research Center;* ***Walter Obrien**,* *Virginia Tech;* ***Vishnu Sishtla**,* *UTC Climate, Controls and Security*	GT2018:75404 **Aerodynamic Effects In A Transonic Compressor With Nonaxisymmetric Tip Clearance** ***Maximilian Juengst**, **Samuel Liedtke**, **Heinz-Peter Schiffer**,* *Institute of Gas Turbines and Aerospace Propulsion, Technische Universität Darmstadt;* ***Bernd Becker**,* *Rolls-Royce Deutschland Ltd & Co KG*	GT2018:77285 **Influence of Blade Loading Profile on Wake Dynamics in High-Pressure Turbine Cascades** ***Benjamin Luymes**, **Adam Steinberg**,* *University of Toronto Institute for Aerospace Studies;* ***Qiang An**,* *University of Toronto;* ***Xue Feng Zhang**,* *GE GRC;* ***Thomas Vandeputte**,* *General Electric*

MONDAY, JUNE 11 — 8:00 - 10:00 AM

	WIND ENERGY	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	EDUCATION
	Introduction to Wind Energy	**Topics in Diagnostics**	**LED-based Absorption Sensors for Early Fire and Hazardous Gases Detection for Flight Vehicles and Propulsion Engines**
	Tutorial Session • Nord-Norge • MA-48-05	**Technical Session • Event Room • MA-5-11**	**Tutorial Session • Jan Mayen 1 • MA-7-03**
	Session Organizer: **Ndaona Chokani,** ETH Zurich Session Co-Chair(s):	Session Organizer: **Craig Davison**, National Research Council Canada	Session Organizer: **Sabri Deniz**, Lucerne University of Applied Sciences
8:00	GT2018:77592 **Introduction to Wind Energy** ***Ndaona Chokani**, ETH Zurich* **T U T O R I A L**	GT2018:76108 **Smart Health Monitoring Based on Digital Models for Centrifugal Pumps in Desalination Industry** ***Amr Abdel Fatah, Mohamed Lotfy**, British University in Egypt; **Mohammed Hassan**, Fayoum University; **Antoine Dimitri**, Cairo University*	GT2018:77581 **LED-based Absorption Sensors for Early Fire and Hazardous Gases Detection for Flight Vehicles and Propulsion Engines** ***Subith Vasu**, University of Central Florida* **T U T O R I A L**
8:30		GT2018:76101 **Fault Diagnosis Method for Inter-shaft Bearings Based on Information Exergy and Random Forest** ***Jing Tian, Ming Zhao,** Northwestern Polytechnical University; **Chengwei Fei,** Hong Kong University of Science and Technology; **Fengling Zhang**, Shenyang Aerospace University*	
9:00		GT2018:75368 **A Two-Layer Multi-Model Gas Path Fault Diagnosis Method** *Yunpeng Cao, Yinghui He, Shuying Li, QingcaiYang, **Rui Liu,** Harbin Engineering University; **Fang Yu**, **Jianwei Du**, China Ship Research and Development Academy*	
9:30		GT2018:75374 **Analysis of Performance of a Twin-Shaft Gas Turbine during Hot-End Damage in the Gas Generator Turbine** ***Samuel Cruz-Manzo, Sepehr Maleki, Yu Zhang,** University of Lincoln; **Vili Panov**, Siemens Industrial Turbomachinery Ltd; **Anthony Latimer**, **Festus Agbonzikilo**, Siemens Industrial Turbomachinery Limited*	

KEYNOTE & PLENARIES
10:15 AM - 12:15 PM

MRO in the Light of Digitalization

Keynote Session • Hall B4 • 50-01

Session Organizer: **Damian Vogt**, University of Stuttgart
Session Co-Chair(s): **Elisabet Syverud,** Dresser-Rand

GT2018:77570
MRO in the Light of Digitalization: Dr. Zuo Zhi Zhao
Zuozhi Zhao, *Siemens Gas Turbine*

GT2018:77571
MRO in the Light of Digitalization: Frode Abotnes
Frode Abotnes*, Statoil*

GT2018:77638
MRO in the Light of Digitalization: Pascal Decoussemaeker
Pascal Decoussemaeker, *GE Power*

GT2018:77639
MRO in the Light of Digitalization: Shawn Gregg
Shawn Gregg*, Delta Air Lines*

GT2018:77648
MRO in the Light of Digitalization: Russell Irving
Rusty Irving*, GE GRC*

P

A

N

E

L

10:15 AM - 12:15 PM

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	USAF Case Study of Utilizing Digital Twin in Propeller Upgrade	**Combustor Design & Development IV**	**Combustion Dynamics: Instability Analysis**
	Panel Session • Jan Mayen 2 • MB-1-12 Part A	**Technical Session • Jan Mayen 3 • MB-4-01 Part A**	**Technical Session • A1-1 • MB-4-16 Part A**
	Session Organizer: **David Kidman,** U.S. Air Force	Session Organizer: **Keith McManus**, GE Global Research Center Session Co-Chair(s): **Jacqueline O'Connor,** Pennsylvania State University	Session Organizer: **Benjamin Emerson**, Georgia Institute of Tech Session Co-Chair(s): **David Noble**, Electric Power Research Institute
2:00	GT2018:77554 **Overview of** ***David Kidman**, U.S. Air Force* GT2018:77555 **Aircraft Laser Measurement and CAD Model Development** ***David Kidman**, U.S. Air Force* **P A N E L**	GT2018:75028 **Experimental And Numerical Investigations Of Characteristics Of An Axial Jet In The Vicinity Of A Confined Concentric Swirl Flow In A Model Combustor** ***Robbin bhagwan, Nikolaos Zarzalis, Peter Habisreuther,** Karlsruhe Institute of Technology (KIT)*	GT2018:75460 **Comparison of flame transfer functions measured with locally resolved full-field-vibrometry and OH*- chemiluminescence** ***Felix Greiffenhagen, Jakob Woisetschlaeger,** Graz University of Technology; **Johannes G[n]rtler, Heiko Scholz, Robert Kuschmierz, J[n]rgen Czarske,** Technische Universitat Dresden*
2:30		GT2018:75419 **Experience of Low-Emission Combustion of Aviation And Bio Fuels In Separate Flames Behind Front Mini-Modules of a Combustion Chamber** ***Alexander Vasilyev, Vladimir Zakharov, Vyacheslav Lyashenko, Oganes Chelebyan, Anna Maiorova, Roman Medvedev,** Central Institute of Aviation Motors*	GT2018:75804 **High Frequency Measurement Of Temperature And Composition Spots With LITGS** ***Francesca De Domenico, Steven M. Lowe, Luming Fan, Simone Hochgreb,** University of Cambridge; **Priyav Shah, Paul Ewart, Benjamin A.O. Williams,** University of Oxford*
3:00		GT2018:75621 **Impact of Upstream Boundary Conditions on Fuel Injector Performance in a Low TRL Reacting Flow Experimental Facility** ***Maxwell A Williams, Jonathan F Carrotte, A John Moran, A Duncan Walker,** Loughborough University*	GT2018:76506 **Low-order network modeling for annular combustors exhibiting longitudinal and circumferential modes** ***Dong Yang, Aimee S. Morgans, I**mperial College London*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	CYCLE INNOVATIONS	EDUCATION
	Topics in Instrumentation	**Hybrid Solutions, Integration of Storage and Renewable**	**Education Issues**
	Technical Session • Event Room • MB-5-12 Part A	**Panel Session • Hall B4 • MB-6-14**	**Technical Session • Jan Mayen 1 • MB-7-01 Part A**
	Session Organizer: **Lubomir Ribarov**, Pratt & Whitney Session Co-Chair(s): **Richard Bunce**, Measurement Solutions; **Vivek Badami,** General Electric	Session Organizer: **David Sanchez**, University of Seville Session Co-Chair(s): **Alexander Wiedermann**, Man Diesel & Turbo SE	Session Organizer: **Devin O'Dowd**, United State Air Force Session Co-Chair(s): **Sabri Deniz**, Lucerne University of Applied Sciences
2:00	GT2018:76793 **Near-wing multi-sensor diagnostics of jet engine components** ***Wojciech Frackowiak, Sebastian Barton, Jochen Schlobohm, Yinan Li, Wilfried Reimche, Markus Kaestner, Eduard Reithmeier, Oliver Bruchwald, David Zaremba,*** *Leibniz Universität Hannover*	GT2018:77553 **Hybrid power solutions towards decarbonized energy systems** ***Sven Hendrik Wiers****, Man Turbo Ag* GT2018:77576 **Renewables and Storage in the Decentralized, Digital, and Decarbonized Future of Electricity** ***Doug Hofer****, GE* GT2018:77589 **Energy Storage and Renewables - An EPC Perspective** ***Seyfettin Can Gulen****, Bechtel Infrastructure & Power Inc.*	GT2018:75048 **Exergy Loss Considerations in Education for a Turbofan Power Cycle** ***Hans Wettstein****, HEW*
2:30	GT2018:76906 **Engine-scalable Rotor Casing Convective Heat Flux Evaluation Using Inverse Heat Transfer Methods** ***David Gonzalez Cuadrado, Francisco Lozano, Valeria Andreoli, Guillermo Paniagua,*** *Purdue University*	**P A N E L**	GT2018:75610 **INTEGRATION OF HELICOPTER ANNULAR COMBUSTION CHAMBER RIG IN PROPULSION SYSTEMS COURSE FOR GRADUATE STUDENTS** ***Ibrahim Al Asmi, Alexis Vandel, Frederic Grisch, Bruno Renou,*** *INSA Rouen Normandie;* ***Gilles Cabot,*** *Rouen University UMR CNRS 6614;* ***Vincent Moureau,*** *CORIA;* ***Nicolas Savary, Stephane Richard,*** *Safran Helicopter Engines*
3:00	GT2018:76657 **Blade vibration monitoring in a low-pressure steam turbine** ***Radoslaw Przysowa,*** *ITWL - Air Force Institute of Technology*		GT2018:76918 **Using Mobile Quiz Application to Enhance Learning in Combustion Kinetics Course for Students of Mechanical Engineering and Transport Systems** ***Neda Djordjevic****, Technische Universität Berlin*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	ELECTRIC POWER	FANS & BLOWERS	HEAT TRANSFER: EXPERIMENTAL FILM COOLING
	Combined Cycle Gas Turbine Asset Management: A Utility Industry Worldwide Perspective	**Fans and Blowers: Computational Fluid Dynamics**	**Hole Geometry Effects I**
	Panel Session • A1-2 • MB-8-07 Part A	**Technical Session • E-5 • MB-9-01**	**Technical Session • A1-3 • MB-19-03 Part A**
	Session Organizer: **Robert Steele,** Electric Power Research Institute Session Co-Chair(s): **Christer Bjorkqvist**, European Turbine Network	Session Organizer: **Giovanni Delibra**, Sapienza University of Rome Session Co-Chair(s): **Lorenzo Tieghi**, Dept. of Mechanical and Aerospace Engineering, Sapienza University of Rome	Session Organizer: **Brett Barker**, Rolls-Royce Session Co-Chair(s): **Jaideep Pandit**, Virginia Polytechnic Institute & State University
2:00	GT2018:77525 **An International Persepctive of Issues Related to Managing and Operating CCGT Assets** ***Robert Steele**, Electric Power Research Institute* GGT2018:77524 **Managing the ENEL/Endesa worldwide Fleet** ***Tomas Alvarez**, ENEL/Endesa* GT2018:77523 **Managing Uniper Worldwide CCGT Assets** ***Pedro Lopez**, Uniper*	GT2018:76083 **Impact Research of Water Injection Holes Arrangement on Cavitation Flow Control** ***Wei Wang, Shengpeng Lu, Tengfei Hou, Yan Liu, Rong Xie, Xiaofang Wang,** Dalian unviersity of technology; **Qi Yi**, China Ship Scientific Research Center*	GT2018:75167 **Film Cooling Effectiveness from Two-Row of Compound Angled Cylindrical Holes using PSP Technique** ***Nian Wang, Mingjie Zhang, Chao-Cheng Shiau, Je-Chin Han**, Texas A&M University*
2:30	**P A N E L**	GT2018:76687 **Experimental and Numerical Investigations of Unsteady Flow Characteristics in a Double-inlet Centrifugal Fan** ***Hua-Shu Dou, Meina Xiao, Yikun Wei,** Zhejiang Sci-Tech University; **Yongning Chen, Haijiang He, Xinxue Ye, Wenbin Cao,** Zhejiang Yilida Ventilator Co. Ltd.*	GT2018:75456 **Effects of Streamwise Distance and Density Ratio on Film-Cooling Effectiveness for Double-Jet Film-Cooling on A Flat Plate** ***Jiaxu YAO, Jiang Lei, Junmei Wu,** Xi'an Jiantong University; **Yu Fang**, Dongfang Turbine Co., Ltd; **Lesley Wright**, Baylor University*
3:00		GT2018:76740 **Simulation of the blade aging process for an induced draft fan exposed to fly ash particles** ***Alessio Castorrini, Alessandro Corsini, Franco Rispoli,** Sapienza University of Rome; **Paolo Venturini**, Dipartimento di Meccanica e Aeronautica, 'Sapienza*	GT2018:75836 **Experimental Study of Periodic Free Stream Unsteadiness Effects on Discrete Hole Film Cooling in Two Geometries** ***Daniel D. Borup, Danyang Fan, Christopher J. Elkins, John K. Eaton,** Stanford University*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	HEAT TRANSFER: GENERAL COMPUTATIONAL HEAT TRANSFER	HEAT TRANSFER: TUTORIALS	INDUSTRIAL & COGENERATION
	General Computational Heat Transfer II	**Turbine Cooling Fundamentals**	**Combustion & Emissions**
	Technical Session • A1-6 • MB-22-02 Part A	**Tutorial Session • A1-4 + A1-5 • MB-14-02**	**Tutorial Session • Oslo • MB-23-06 Part A**
	Session Organizer: **Riccardo Da Soghe,** Ergon Research Session Co-Chair(s): **SANJAY CHOPRA**, GE AVIATION	Session Organizer: **Andrew Nix**, West Virginia University	Session Organizer: **Michael Klassen,** Combustion Science & Engrg Session Co-Chair(s): **Leonard Angello**, EPRI; **Manfred Klein**, MA Klein & Associates
2:00	GT2018:76896 **Thermal Boundary Layer Response to Periodic Fluctuations** ***Jorge Saavedra, Guillermo Paniagua**, Purdue University; **Olivier Chazot**, the von Karman Institute for Fluid Dynamics*	GT2018:75886 **Turbine Cooling Fundamentals** ***Kenichiro Takeishi**, Tokushima Bunri University* **T U T O R I A L**	GT2018:77510 **The Basics of Air Pollution and Greenhouse Gas Emissions** ***Michael Klassen**, Combustion Science & Engrg* GT2018:77511 **A Summary of Cost-Effective Solutions for Gas Turbine Emissions Prevention and Control, with Economic Considerations** ***Leonard Angello**, EPRI* **T U T O R I A L**
2:30	GT2018:77135 **LES study of the laminar heat transfer augmentation on the pressure side of a turbine vane under freestream turbulence** ***Yousef Kanani, Sumanta Acharya,** Illinois Institute of Technology; **Forrest Ames**, University Of North Dakota*		
3:00	GT2018:77167 **Meander like Shape Optimization of the Stator-Rotor Platform Cavity** ***Paht Juangphanich, Guillermo Paniagua,** Purdue University*		

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	MANUFACTURING MATERIALS & METALLURGY	FANS & BLOWERS	
	Additive Manufacturing with Metals Tutorial Part I	**Fans and Blowers: Computational Fluid Dynamics**	
	Tutorial Session • Svalbard • MB-24-11	**Technical Session • e-5 • MB-9-01**	
	Session Organizer: **Henry Bernstein,** Gas Turbine Materials Assoc	Session Organizer: **Giovanni Delibra**, Sapienza University of Rome Session Co-Chair(s): **Lorenzo Tieghi**, Dept. of Mechanical and Aerospace Engineering, Sapienza University of Rome	
2:00	GT2018:77494 **Additive Manufacturing with Metals Tutorial Part I** ***Timothy W. Simpson**, Penn State University* **T U T O R I A L**	GT2018:76083 **Impact Research of Water Injection Holes Arrangement on Cavitation Flow Control** ***Wei Wang, Shengpeng Lu, Tengfei Hou, Yan Liu, Rong Xie, Xiaofang Wang,** Dalian unviersity of technology; **Qi Yi**, China Ship Scientific Research Center*	
2:30		GT2018:76687 **Experimental and Numerical Investigations of Unsteady Flow Characteristics in a Double-inlet Centrifugal Fan** ***Hua-Shu Dou, Meina Xiao, Yikun Wei,** Zhejiang Sci-Tech University; **Yongning Chen, Haijiang He, Xinxue Ye, Wenbin Cao,** Zhejiang Yilida Ventilator Co. Ltd.*	
3:00		GT2018:76740 **Simulation of the blade aging process for an induced draft fan exposed to fly ash particles** ***Alessio Castorrini, Alessandro Corsini, Franco Rispoli,** Sapienza University of Rome; **Paolo Venturini**, Dipartimento di Meccanica e Aeronautica, 'Sapienza*	

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	MANUFACTURING MATERIALS & METALLURGY	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	OIL & GAS APPLICATIONS
	Additive Manufacturing with Metals Tutorial Part I	**Microturbine Combustion and Fuels**	**Diagnostic, Prognostic and Control**
	Tutorial Session • Svalbard • MB-24-11	**Technical Session • Nord-Norge • MB-26-08**	**Technical Session • Sør-Norge• MB-27-01**
	Session Organizer: **Henry Bernstein**, Gas Turbine Materials Assoc	Session Organizer: **Ward De Paepe**, Vrije Universiteit Brussel Session Co-Chair(s): **Dominik Ebi,** PSI	Session Organizer: **Klaus Brun**, Southwest Research Institute Session Co-Chair(s): **Mauro Venturini**, Universitα Degli Studi Di Ferrara
2:00	GT2018:77494 **Additive Manufacturing with Metals Tutorial Part I** *Timothy W. Simpson, Penn State University* **T U T O R I A L**	GT2018:75789 **Numerical Investigation of Spray Development in a Micro Gas Turbine LPP Combustor with Airblast Atomizer** ***Maria Cristina Cameretti, Gianluca Annunziata, Roberta De Robbio**, D.I.I., Università Di Napoli Federico II; **Raffaele Tuccillo**, Univ Of Naples*	GT2018:75006 **Capability of the Bayesian Forecasting Method to predict field timeseries** ***Nicolɜ Gatta, Mauro Venturini, Lucrezia Manservigi**, Universitα Degli Studi Di Ferrara; **Giuseppe Fabio Ceschini**, Siemens AG; **Giovanni Bechini**, Siemens Spa*
2:30		GT2018:75993 **NOx reduction of a swirl combustor firing ammonia for a micro gas turbine** ***Norihiko Iki, Osamu Kurata, Takahiro Inoue, Takayuki Matsunuma, Taku Tsujimura, Hirohide FURUTANI**, National Institute of Advanced Industrial Science and Technology (AIST); **Hideaki Kobayashi, Akihiro Hayakawa, Ekenechukwu C. Okafor**, Tohoku University*	GT2018:75007 **Detection and Classification of Sensor Anomalies in Gas Turbi*ne Field Data*** ***Giuseppe Fabio Ceschini**, Siemens AG; **Lucrezia Manservigi**, **Mauro Venturini**, Universitα Degli Studi Di Ferrara; **Giovanni Bechini**, Siemens Spa*
3:00		GT2018:76667 **A biogas fuelled micro gas turbine using dual-fuel approach** ***Raffaela Calabria, Fabio Chiariello, Patrizio Massoli, Fabrizio Reale**, Istituto Motori -CNR*	GT2018:75046 **PERFORMANCES OF GAS TURBINES IN OIL & GAS APPLICATIONS: SIMPLE THERMODYNAMIC METHODS HELP PREDICT MAJOR TRENDS** ***Michel MOLIERE,** Universite De Technologie De Belfort Montbél; **Thierry SCHUHLER**, **Mai RICHE**, **Dominique ORHON**, TOTAL SA; **Assaad ZOUGHAIB**, **Mines Paristech**, PSL Research University Centre d'Efficacité énergétique des Systèmes; **Alessia BUSCO**, Politecnico di BAri/ ENSAM*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	STEAM TURBINES	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS
	LSB and Exhaust Design Aspects	**Gas Bearings 1**	**Probabilistic Applications**
	Technical Session • Romerike • MB-29-07	**Technical Session • E-6 • MB-34-12**	**Technical Session • E-8 • MB-32-01 Part A**
	Session Organizer: **Tadashi Tanuma**, Teikyo University Session Co-Chair(s): **Hiteshkumar Mistry**, General Electric	Session Organizer: **Jurg Schiffmann**, Ecole Polytechnique Federale De Lausanne	Session Organizer: **Kai Kadau**, Siemens Session Co-Chair(s): **Mark Andrews**, SmartUQ
2:00	GT2018:75248 **The Pressure Field at the Output from a Low Pressure Exhaust Hood and Condenser Neck of the Steam Turbine 1090 MW - the Experimental and Numerical Research** ***Michal Hoznedl**, **Kamil Sedlák**, **Lukas Bednar**, **Robert Kalista**, Doosan èkoda Power; **Antonin Zivny**, NUM Solution, s.r.o; **Ladislav Tajc**, University of West Bohemia; **Ales Macalka**, NUM Solution*	GT2018:77111 **A HIGH SPEED TEST RIG CAPABLE OF RUNNING AT 190,000 RPM TO CHARACTERIZE GAS FOIL THRUST BEARINGS** ***Nguyen LaTray**, **Daejong Kim**, University of Texas at Arlington*	GT2018:75561 **On the Transferability of Probabilistic Fracture Mechanics Results for Scaled 50Hz and 60Hz Market Heavy Duty Gas Turbine Rotor Forgings** ***Christian Amann**, **Kai Kadau**, Siemens; **Peter Gumbsch**, Karlsruher Institute of Technology*
2:30	GT2018:75375 **The Effect of Stage-Diffuser Interaction on the Aerodynamic Performance and Design of LP Steam Turbine Exhaust Systems** ***Bowen Ding**, **Liping Xu**, University of Cambridge; **Jiandao Yang**, **Rui Yang**, **Yuejin Dai**, Shanghai Turbine Works Co., Ltd*	GT2018:76261 **Effect of Axial Force on Rotordynamics of a Rigid Rotor Supported by Foil Bearings** ***Wanhui Liu**, **Feng Kai**, Hunan University; **Daejong Kim**, University of Texas at Arlington*	GT2018:75763 **Probabilistic design of radial pins constraint system in a gas turbine annular combustion chamber** ***Federico Funghi**, Paolo di Sisto, BHGE*
3:00	GT2018:75499 **A NOVEL EVALUATION PROCEDURE FOR THE PREDICTION AND ASSESSMENT OF DIFFUSER HUMMING IN STEAM TURBINES** ***Johannes Tusche**, **Christian Musch**, Siemens AG*	GT2018:75555 **Ultra-High Temperature Compliant Foil Bearings - The Journey to 870°C and Application in Gas Turbine Engines: Experiment** ***Hooshang Heshmat**, James F. Walton II, Mohawk Innovative Technology, Inc; **Brian D. Nicholson**, Air Force Research Lab*	GT2018:76477 **Reliability analysis on a turbine disk considering the coupling of multiple failure modes** ***Dianyin Hu**, **Ying Shi**, **Xi Liu**, **Rongqiao Wang**, Beihang University*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS
	Mistuning II	**Supercritical CO2 Compressors**	**Aerodynamic Performances and Design**
	Technical Session • E-7 • MB-35-04 Part A	**Technical Session • Akershus • MB-38-02 Part A**	**Technical Session • E-4 • MB-41-08**
	Session Organizer: **Bernd Beirow,** Brandenburg University Of Technology Cottbus-Senftenberg Session Co-Chair(s): **Teresa Berruti**, Politecnico di Torino	Session Organizer: **Kevin Hoopes**, Southwest Research Institute	Session Organizer: **Reid A. Berdanier**, Penn State University
2:00	GT2018:76375 **Automated Meshing Algorithm for generating As-Manufactured Finite Element Models Directly from As-Measured Fan Blades and Integrally Bladed Disks** ***Alex Kaszynski**, Universal Technology Corporation; **Joseph Beck**, Perceptive Engineering Analytics LLC; **Jeffrey M. Brow**n, US Air Force Research Laboratory*	GT2018:75067 **Centrifugal Compressor Design for Near-Critical Point Applications** ***Alireza Ameli, Ali Afzalifar**, **Teemu Turunen-Saaresti**, **Jari Backman**, Lappeenranta University of Technology*	GT2018:76345 **Aerodynamic Measurements and Analysis in a First Stage Nozzle Guide Vane Passage with Combustor Liner Cooling, Slot Film Cooling and Endwall Contouring** ***Mahmood Alqefl**, **Terrence Simon**, University of Minnesota; **Yong Kim**, Solar Turbines Inc; **Hee-Koo Moon,** Yonsei University; **Luzeng Zhang**, Independent Consultant*
2:30	GT2018:76385 **Representation and analysis of geometric uncertainties in rotor blades** ***Luigi Carassale**, University of Genova **Andrea Cavicchi**, **Silvia Bruzzone**, **Michela Marrè Brunenghi**, Ansaldo Energia*	GT2018:75102 **Numerical Simulations of CO2 Compressors at Near-Critical and Sub-Critical Inlet Conditions** ***Ashvin Hosangadi, Timothy Weathers, Zisen Liu, Vineet Ahuja,** Craft Tech; **Judy Busby**, JB Design and Consulting LLC*	GT2018:76036 **AERO DERIVATIVE MECHANICAL DRIVE GAS TURBINES: THE DESIGN OF INTERMEDIATE PRESSURE TURBINES** ***Alberto Scotti Del Greco, Vittorio Michelassi, Stefano Francini, Daniele Di Benedetto**, Baker-Hughes, a GE Company; **Mahendran Manoharan**, GE Aviation*
3:00	GT2018:76888 **Mistuning Evaluation Comparison via As-Manufactured Models, Traveling Wave Excitation, and Compressor Rigs** *Daniel Gillaugh, AFRL/RQTI; Alex Kaszynski, Universal Technology Corporation; Jeffrey M. Brown, US Air Force Research Laboratory; Joseph Beck, Perceptive Engineering Analytics LLC; Joseph C. Slater, Wright State University*	GT2018:75590 **Influence of Relative Velocity Ratio on Centrifugal Impellers Operating with Supercritical CO2** ***Haiqing Liu, Zhongran Chi, Shusheng Zang,** Shanghai Jiao Tong University*	GT2018:75157 **A HIGH FIDELITY QUALITY ASSESSMENT OF HIGH PRESSURE TURBINE BLADES USING SURFACE CURVATURE AND GRADIENT-BASED ADJOINT** ***Akhil Mulloth,** Rolls Royce India Pvt. Ltd; **Gabriel Banks**, **Giulio Zamboni**, **Simon Bather**, Rolls-Royce Plc*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS
	Optimization Methods, Multi-Physics Coupling and Fan Design Methods	**Surrogate-Assisted Approaches, Including Sampling and Data Mining**	**Centrifugal Compressors: Secondary Flows & Losses**
	Technical Session • E-3 • MB-42-08 Part A	**Technical Session • E-2 • MB-46-03 Part A**	**Technical Session • E-1 • MB-44-06 Part A**
	Session Organizer: **Benjamin Walther**, GE Aviation Session Co-Chair(s): **Tom Verstraete**, Von Karman Institute for Fluid Dynamics; **Dragan Kozulovic**, Hamburg University of Applied Science	Session Organizer: **Christian Voß**, German Aerospace Center (DLR) Session Co-Chair(s): **Christoph Starke**, Siemens	Session Organizer: **Hamid Hazby**, PCA Engineers Limited Session Co-Chair(s): **Liping Xu**, University of Cambridge
2:00	GT2018:77098 **Machine Learning enabled Adaptive Optimization of a Transonic Compressor Rotor with Pre-compression** ***Michael M. Joly, Soumalya Sarkar, Dhagash Mehta,*** *United Technologies Research Center*	GT2018:75160 **A Multi-Fidelity Sampling Method for Efficient Design and Optimization of Centrifugal Compressor Impellers** ***Christoph Schemmann, Norbert Kluck, FH Dortmund; Marius Geller,*** *University of Applied Sciences Dortmund*	GT2018:75345 **Influences of Tip Leakage Flows Discharged from Main and Splitter Blades on Flow Field in Transonic Centrifugal Compressor Stage** ***Masanao Kaneko,*** *Tokyo Denki University;* ***Hoshio Tsujita****, Hosei University*
2:30	GT2018:76870 **A Methodology for Fully-Coupled CFD Engine Simulations, Applied to a Micro Gas Turbine Engine** ***Mateus Teixeira, Luigi Romagnosi, Mohamed Mezine, Yannick Baux, Jan Anker, Kilian Claramunt,*** ***Charles Hirsch,*** *NUMECA International*	GT2018:75448 **Three-dimensional Blade Shape Optimization for a Transonic Axial Flow Compressor Through Incorporating Surrogate Model and Sequential Sampling** ***Xuesong Wang, Jinju Sun, Peng Song, Youwei He, Da Xu,*** *Xi'an Jiaotong University*	GT2018:75688 **3D Computational Analysis of a Compressor for Heavy Duty Truck Engine Turbochargers** ***Matthias Abel, Michael Woehr, Markus Mueller, Johannes Leweux, Daimler AG; Peter Newton, Ricardo Martinez-Botas,*** *Imperial College London*
3:00	GT2018:75115 **Calculation of Intake-Fan-Bypass Interaction with a Fan Similarity Model** ***Mauro Carnevale, Feng Wang, Luca Di Mare,*** *University of Oxford*	GT2018:76148 **Multi-fidelity Kriging-based Optimization of Engine Subsystem Models with Medial Meshes** ***Hau Kit Yong, Leran Wang, David Toal, Andy J. Keane, University of Southampton; Felix Stanley,*** *Rolls-Royce plc*	GT2018:76231 **Characterization and Impact of Secondary Flows in a Discrete Passage Centrifugal Compressor Diffuser** ***David Erickson, Michael Macrorie,*** *GE Aviation;* ***Choon S. Tan,*** *Massachusetts Institute of Technology*

MONDAY, JUNE 11 — 2:00 - 3:30 PM

	WIND ENERGY	CYCLE INNOVATIONS	
	Latest Developments on Wind Turbine Design	**Sustainable Energy for All**	
	Tutorial Session • Hordaland • MB-48-06	**Panel Session • Hall B4 • MC-6-15**	
	Session Organizer: **George Pechlivanoglou**, HFI TU Berlin Session Co-Chair(s): **Alessandro Bianchini**, University of Florence	Session Organizer: **Piero Colonna**, Delft University of Technology Session Co-Chair: **Francesco Roncallo**, University of Genoa	
2:00	GT2018:77593 **Latest Developments on Wind Turbine Design - Part 1: HAWTs** ***George Pechlivanoglou**, HFI TU Berlin* GT2018:77594 **Latest Developments on Wind Turbine Design - Part 2: VAWTs** ***Alessandro Bianchini**, University of Florence* **T** **U** **T** **O** **R** **I** **A** **L**	GT2018:77608 **Multidisciplinary approach for energetic assessment in developing countries** ***Francesco Roncallo,** University of Genoa* GT2018:77610 **Academia due on international cooperation** ***David Sanchez**, University of Seville* GT2018:77609 **Emerging technologies for off grid communities** ***Iana Aranda**, ASME* **P** **A** **N** **E** **L**	
2:30			
3:00			

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	USAF Case Study of Utilizing Digital Twin in Propeller Upgrade	**Combustor Design & Development IV**	**Combustion Dynamics: Instability Analysis**
	Panel Session • Jan Mayen 2 • MC-1-12 Part B	**Technical Session • Jan Mayen 3 • MC-4-01 Part B**	**Technical Session • A1-1 • MC-4-16 Part B**
	Session Organizer: **David Kidman**, U.S. Air Force	Session Organizer: **Keith McManus**, GE Global Research Center Session Co-Chair(s): **Jacqueline O'Connor,** Pennsylvania State University	Session Organizer: **Benjamin Emerson**, Georgia Institute of Tech Session Co-Chair(s): **David Noble**, Electric Power Research Institute
4:00	GT2018:77556 **CFD Predicting Aircraft Aerodynamics and Propeller Performance** ***Jason Klepper**, QuantiTech, Inc* GT2018:77561 **Comparison of Model Predictions to Actual Flight Test Results** ***Edward Burgos**, U.S. Air Force* GT2018:77562 **Model-Based Test Approach, Lessons, Follow-on and Summary** ***Reagan Woolf**, US Air Force* **P A N E L**	GT2018:75760 **NUMERICAL AND EXPERIMENTAL INVESTIGATION OF THE FLAME STRUCTURES IN A NEW LAB-SCALE GAS TURBINE SWIRL BURNER** ***Erdzan Hodzic, QUB; SENBIN YU, Arman Ahamed Subash, XIN LIU, Robert-Zoltan Szasz, XUE-SONG BAI, ZHONGSHAN LI, Marcus Aldén,** Lund University; **Liu Xiao**, College of Power and Energy Engineering, Harbin Engineering University*	GT2018:76797 **Effects of asymmetry on thermoacoustic modes in annular combustors: a higher-order perturbation study** ***Georg Atta Mensah, Alessandro Orchini**, TU Berlin; **Luca Magri**, University of Cambridge; **Jonas P. Moeck**, TUB/NTNU*
4:30		GT2018:76900 **AUTOMATED DESIGN OPTIMIZATION OF A SMALL-SCALE HIGH-SWIRL CAVITY-STABILIZED COMBUSTOR** ***Alejandro M Briones,** University of Dayton; **David Burrus**, **Joshua Sykes**, Innovative Scientific Solutions, Inc; **Brent Rankin**, **Andrew Caswell**, Air Force Research Laboratory*	GT2018:76838 **STABILITY AND LIMIT CYCLES OF A NONLINEAR DAMPER ACTING ON A LINEARLY UNSTABLE THERMOACOUSTIC MODE** ***Claire Bourquard**, **Nicolas Noiray**, ETH Zurich*
5:00			GT2018:76921 **THERMOACOUSTIC MODES OF QUASI-1D COMBUSTORS IN THE REGION OF MARGINAL STABILITY** ***Camilo F. Silva, Kah J. Yong,** Technical University of Munich; **Luca Magri**, University of Cambridge - Dept. of Engineering*

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	EDUCATION	ELECTRIC POWER
	Topics in Instrumentation	**Education Issues**	**Combined Cycle Gas Turbine Asset Management: A Utility Industry Worldwide Perspective**
	Technical Session • Event Room • MC-5-12 Part B	**Technical Session • Jan Mayen 1 • MC-7-01 Part B**	**Panel Session • A1-2 • MC-8-07 Part B**
	Session Organizer: **Lubomir Ribarov,** Pratt & Whitney Session Co-Chair(s): **Richard Bunce**, Measurement Solutions; **Vivek Badami**, General Electric	Session Organizer: **Devin O'Dowd,** United States Air Force Session Co-Chair(s): **Sabri Deniz**, Lucerne University of Applied Sciences	Session Organizer: **Robert Steele**, Electric Power Research Institute Session Co-Chair(s): **Christer Bjorkqvist**, European Turbine Network
4:00	GT2018:76221 **Towards An Improved Lifing Methodology For Thermocouple Probes Used In Gas Turbines** ***Michele Scervini, Catherine Rae**, University of Cambridge; **Richard Page, Mark Rudkin, Stephen O'Dell, Daniel Loveless,** Esterline Advanced Sensors*	GT2018:77074 **Teaching Gas Turbine Technology to Undergraduate Students in Sweden** ***Ioanna Aslanidou, Valentina Zaccaria, Konstantinos Kyprianidis, Nathan Zimmerman,** Mälardalen; **Evangelia Pontika, Anestis Kalfas,** Aristotle Univ Of Thessaloniki*	GT2018:77526 **Managing and Evaluating Operational Risk with Industrial GTCC Assets** ***Bin Zhou**, FM Global* GT2018:77527 **Hydrogen Fuel Economy and Future of Carbon Capture and Storage** ***Henrik Andersen**, Statoil ASA*
4:30	GT2018:75293 **Wall temperature measurements in gas turbine combustors with thermographic phosphors** ***Patrick Nau, Zhiyao Yin, Oliver Lammel, Wolfgang Meier,** German Aerospace Center (DLR*	GT2018:77173 **Computational Aid to AEDsys for Designing a Variable-Area Gas Turbine Nozzle** ***Devin O'Dowd, Aaron Byerley,** United States Air Force Academy*	**P A N E L**
5:00	GT2018:77137 **Real Time Gas Turbine Engine Particulate Ingestion Sensor for Particle Size and Composition** ***George Papadopoulos, Daniel Bivolaru, Jiaji Lin,** Innoveering, LLC*		

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	FANS & BLOWERS	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: GENERAL COMPUTATIONAL HEAT TRANSFER
	Fans and Blowers: Optimization	**Hole Geometry Effects I**	**General Computational Heat Transfer II**
	Technical Session • E-5 • MC-9-03	**Technical Session • A1-3 • MC-19-03 Part B**	**Technical Session • A1-6 • MC-22-02**
	Session Organizer: **Massimo Masi**, University of Padova - DTG Session Co-Chair(s): **Gino Angelini**, Sapienza University of Rome	Session Organizer: **Brett Barker**, Rolls-Royce Session Co-Chair(s): **Jaideep Pandit**, Virginia Polytechnic Institute & State University	Session Organizer: **Riccardo Da Soghe**, Ergon Research Session Co-Chair(s): **SANJAY CHOPRA**, GE AVIATION
4:00	GT2018:76348 **Aeroacoustic Optimization of a Pressure Side Strut Configuration for Subsonic Axial Fans Using Statistical-Empirical Modelling** ***Igor Neifach, Gi-Don Na, Frank Kameier,*** *HS Düsseldorf (ISAVE);* ***Nils Springer, Marco Wichers,*** *Brose Fahrzeugteile GmbH, Oldenburg*	GT2018:76676 **High Resolution Heat Transfer Measurements of Cylindrical Holes Embedded in a Trench with Backward Injection** ***Bo Shi, XUEYING LI, Jing Ren, Hongde Jiang,*** *Tsinghua University*	GT2018:77194 **MATHEMATICAL SIMULATION OF THE GAS TURBINE PACKAGES THERMAL STATE** ***Olena Kyrylash, Volodymyr Kostiuk,*** *National Aerospace University;* ***Andrii Smirnov, Dmytro Tkachenko,*** *Public Joint Stock Company "Sumy Machine-Building Science-and-Production Association";* ***Igor Loboda,*** *Instituto Politecnico Nacional*
4:30	GT2018:76363 **A metamodel for deviation in 2D cascade with variable stagger and solidity and reversible profiles** ***Tommaso Bonanni, David Volponi, Alessandro Corsini, Giovanni Delibra, Lorenzo Tieghi, Gino Angelini,*** *Sapienza University of Rome*	GT2018:75992 **Advanced Film Cooling Performance of a Y-shaped Hole with Inner Crossflow** ***Jianxia Luo, AECC Commerical Aircraft Engine Co., LTD; Huiren Zhu, Cunliang Liu,*** *Northwestern Polytechnical University*	GT2018:76501 **Numerical Investigation on a High Endwall Angle Turbine with Swept-Curved vanes** ***Fusheng Meng, Jie Gao, Weiliang Fu, Xuezheng Liu, Qun Zheng,*** *Harbin Engineering University*
5:00	GT2018:77027 **Aerodynamic Optimization of Axial Fans Using the Adjoint Method** ***Konrad Bamberger, Thomas Carolus,*** *University of Siegen*	GT2018:75389 **Film Cooling Measurements for a Laidback Fan-Shaped Hole - Effect of Coolant Crossflow on Cooling Effectiveness and Heat Transfer** ***Marc Fraas, Tobias Glasenapp, Achmed Schulz, Hans-Joerg Bauer,*** *Karlsruhe Institute of Technology (KIT)*	

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	HEAT TRANSFER: TUTORIALS	INDUSTRIAL & COGENERATION	MANUFACTURING MATERIALS & METALLURGY
	Conjugate Heat Transfer Methodologies for Gas Turbine Combustor Aerothermal Investigation - Joint Tutorial with Combustion, Fuels and Emissions Committee	**Combustion & Emissions**	**Additive Manufacturing with Metals Tutorial Part II**
	Tutorial Session • A1-4 + A1-5 • MC-14-03	**Tutorial Session • Oslo • MC-23-06 Part B**	**Tutorial Session • Svalbard • MC-24-12**
	Session Organizer: **Antonio Andreini,** University of Florence	Session Organizer: **Michael Klassen**, Combustion Science & Engrg Session Co-Chair(s): **Leonard Angello**, EPRI; **Manfred Klein**, MA Klein & Associates	Session Organizer: **Henry Bernstein**, Gas Turbine Materials Assoc Session Co-Chair(s): **Richard Dennis**, US Dept Of Energy
4:00	GT2018:77480 **Conjugate Heat Transfer methodologies for GT combustor aerothermal investigation. A Joint Tutorial with Combustion Fuel & Emission committee.** ***Antonio Andreini,*** *University of Florence;* ***Uwe Ruedel****, Ansaldo Energia Switzerland;* ***Catalin Fotache****, United Technologies Research Center* ***Florent Duchaine****,* ***Laurent Y.M. Gicquel****, CERFACS;* ***Lorenzo Mazzei****, University of Florence* GT2018:77485 **Conjugate Heat Transfer methodologies for GT combustor aerothermal investigation. A Joint Tutorial with Combustion Fuel & Emission committee.** ***Antonio Andreini, Lorenzo Mazzei****, University of Florence;* ***Uwe Ruedel****, Ansaldo Energia Switzerland;* ***Catalin Fotache****, United Technologies Research Center;* ***Florent Duchaine****,* ***Laurent Y.M. Gicquel****, CERFACS*	GT2018:77388 **Combustion & Emissions** ***Manfred Klein****, MA Klein & Associates*	GT2018:77495 **Additive Manufacturing with Metals Tutorial Part II** ***Timothy W. Simpson,*** *Penn State University*
4:30	TUTORIAL	TUTORIAL	TUTORIAL
5:00			

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	OIL & GAS APPLICATIONS	STEAM TURBINES
	Microturbine Design, Development and Performance	**Diagnostic, Prognostic and Control**	**LSB and Exhaust Design Aspects**
	Technical Session • Nord-Norge • MC-26-09	**Technical Session • Sør-Norge• MC-27-01 Part B**	**Technical Session • Romerike • MC-29-07 Part B**
	Session Organizer: **Fangyuan Lou**, Purdue University Session Co-Chair(s): **Raffaele Tuccillo**, Univ Of Naples	Session Organizer: **Klaus Brun**, Southwest Research Institute Session Co-Chair(s): **Mauro Venturini**, Universitα Degli Studi Di Ferrara	Session Organizer: **Tadashi Tanuma**, Teikyo University Session Co-Chair(s): **Hiteshkumar Mistry**, General Electric
4:00	GT2018:76349 **DATA-DRIVEN PRE-DESIGN TOOL FOR SMALL SCALE CENTRIFUGAL COMPRESSORS IN REFRIGERATION** ***Violette Mounier**, **Cyril Picard**, **Jurg Schiffmann**, Ecole Polytechnique Federale De Lausanne*	GT2018:75002 **Control Optimization for Multiple Gas Turbine Driven Compressors** ***Rainer Kurz**, **Roman Zamotorin**, **Matt Lubomirsky**, **Donghui Zhang**, Solar Turbines Inc.; **Klaus Brun**, Southwest Research Institute*	GT2018:75943 **Detached-Eddy Simulation Applied to the Tip-Clearance Flow in a Last Stage Steam Turbine Blade** ***Tianrui Sun**, KTH Royal Institute of Technology; **Paul Petrie-Repar**, Department of Energy Technology, KTH; **Damian Vogt**, University of Stuttgart*
4:30	GT2018:76656 **Numerical study of a micro gas turbine integrated with a supercritical CO2 Brayton cycle turbine** ***Fabrizio Reale**, Istituto Motori –CNR; **Vincenzo Iannotta**, **Raffaele Tuccillo**, Univ Of Naples*	GT2018:75108 **FIXED AREA NOZZLE WITH FREE POWER TURBINE--WHAT MAKES THE MATCH?** ***Muhammad Baig**, **Muhammad Noman**, Sui Northern Gas pipelines Ltd; **Nasir Hayat**, University of Engineering and Technology*	GT2018:76539 **Development of a robust LP blade family for variable speed applications** ***Martin Schubert**, **Johannes Tusche**, Siemens AG*
5:00	GT2018:75313 **Kongsberg Gas Turbines Through Fifty Years - a Review of the Products and the History** ***Tore Naess**, Consultant*		GT2018:76562 **Numerical Investigation of the influence of Hood Height Variation on Performance of Low Pressure Steam Turbine Exhaust Hoods** ***Dickson Munyoki**, **Markus Schatz**, **Damian Vogt**, University of Stuttgart*

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Gas Bearings 2	**Probabilistic Applications**	**Mistuning II**
	Technical Session • E-6 • MC-34-13	**Technical Session • E-8 • MC-32-01 Part B**	**Technical Session • E-7 • MC-35-04 Part B**
	Session Organizer: **Daniel Lubell**, Oil-Free Machinery, LLC	Session Organizer: **Kai Kadau**, Siemens Session Co-Chair(s): **Mark Andrews**, SmartUQ	Session Organizer: **Bernd Beirow**, Brandenburg University Of Technology Cottbus-Senftenberg Session Co-Chair(s): **Teresa Berruti**, Politecnico di Torino
4:00	GT2018:76273 **A Feasibility Study of Controllable Gas Foil Bearings with Piezoelectric Materials via Rotordynamic Model Predictions** ***Jisu Park, Kyuho Sim,*** *Seoul National University of Science and Technology*	GT2018:77058 **Influences of Non-Destructive Inspection Simulation on Fracture Risk Assessment of Additively Manufactured Turbine Engine Components** ***Michael Enright, R. Craig McClung, James Sobotka, Jonathan P. Moody, John McFarland, Yi-Der Lee,*** *Southwest Research Institute;* ***Irving Gray***, ***Joe Gray***, *NDE Technologies, Inc*	GT2018:76834 **An Experimental Study of Resonance Frequency Detuning Applied to Blade Mistuning** ***Garrett Lopp, Jeffrey Kauffman****, University of Central Florida*
4:30	GT2018:76312 **Compliant Hybrid Gas Bearing Using Modular Hermetically Sealed Squeeze Film Dampers** ***Bugra Ertas****, GE Global Research Center;* ***Adolfo Delgado****, Texas A&M University*	GT2018:76609 **SURROGATE MODELING MANUFACTURING VARIATION EFFECTS ON UNSTEADY INTERACTIONS IN A TRANSONIC TURBINE** ***Jeffrey M. Brown,*** *US Air Force Research Laboratory;* ***Joseph Beck****, Perceptive Engineering Analytics LLC;* ***Alex Kaszynski****, Universal Technology Corporation;* ***John Clark****, AFRL/RQTT*	GT2018:76572 **HIGH-FIDELITY SENSITIVITY ANALYSIS OF MODAL PROPERTIES OF MISTUNED BLADED DISKS REGARDING MATERIAL ANISOTROPY** ***Adam Koscso,*** *Sussex University;* ***Guido Dhondt****, MTU Aero Engines;* ***Evgeny Petrov****, The University of Sussex*
5:00	GT2018:77212 **Dynamic Characterization of a Novel Externally Pressurized Compliantly Damped Gas-Lubricated Bearing with Hermetically Sealed Squeeze Film Damper Modules** ***Adolfo Delgado,*** *Texas A&M University;* ***Bugra Ertas****, GE Global Research Center*	GT2018:76431 **Treating uncertainties to Generate a Robust Design of Gas Turbine Disk Using L Moments and Scarce Samples Including Outliers** ***Deepan Jayaraman,*** *Palaniappan Ramu, Indian Institute of Technology;* ***Suhas Suresh***, ***Vinay Ramanath****, Siemens Corporate Technology*	GT2018:76566 **Analysis of deformation of mistuned bladed disk with friction and random crystal anisotropy orientation using gradient-based polynomial chaos** ***Rahul Rajasekharan****, Sussex University;* ***Evgeny Petrov****, The University of Sussex*

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	SUPERCRITICAL CO2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY
	Supercritical CO_2 Compressors	**Endwall Profiling**	**Optimization Methods, Multi-Physics Coupling and Fan Design Methods**
	Technical Session • Akershus • MC-38-02 Part B	**Technical Session • E-4 • MC-41-01**	**Technical Session • E-3 • MC-42-08 Part B**
	Session Organizer: **Kevin Hoopes**, Southwest Research Institute	Session Organizer: **Emil Goettlich**, Graz University of Technology Session Co-Chair(s): **Rosario Spataro**, PCA Engineers Limited	Session Organizer: **Benjamin Walther**, GE Aviation Session Co-Chair(s): **Tom Verstraete**, Von Karman Institute for Fluid Dynamics; **Dragan Kozulovic**, Hamburg University of Applied Science
4:00	GT2018:76943 **RANS simuation of a radial compressor with supercritical CO2 fluid for external loss model development** ***Seong Gu Kim, Seong Kuk Cho, Jeong Ik Lee,*** *Korea Advanced Institute of Science and Technology (KAIST);* ***Jekyoung Lee, Si Woo Lee,*** *Jinsol Turbo;* ***Yacine Addad,*** *Khalifa University of Science and Technology;* ***Jae Eun Cha,*** *Korea Atomic Energy Research Institute (KAERI)*	GT2018:75061 **Influence of a Non-Axisymmetric Endwall on the Flow Field in a Turbine Passage - High-Resolution LDV** ***Jonas Schmid, Achmed Schulz, Hans-Joerg Bauer,*** *Karlsruhe Institute of Technology (KIT)*	GT2018:77042 **Aerodynamic Design System for Non-axisymmetric Boundary Layer Ingestion Fans** ***Sandeep Kumar, Kiran Siddappaji, Mark Turner,*** *University of Cincinnati;* ***Mark Celestina,*** *NASA Glenn Research Center*
4:30	GT2018:77026 **Experimental Validation of a Wide-Range Centrifugal Compressor Stage for Supercritical CO2 Power Cycles** ***Timothy Allison, Natalie Smith, Jason Wilkes,*** *Southwest Research Institute;* ***Robert Pelton, Sewoong Jung,*** *Hanwha Power Systems*	GT2018:76070 **Non-Axisymmetric Endwall Profiling of a Stator Row in the presence of the Rotor in a High Pressure Turbine** ***Abdul Rehman, Zhenzhe Na,*** *School of Power and Energy, Northwestern Polytechnic University* ***Bo Liu, Hao Cheng,*** *Northwestern Polytechnical University*	GT2018:75660 **Low order modelling for fan and outlet guide vane in aero-engines** ***Jiahuan Cui, Rob Watson, Paul G. Tucker,*** *University of Cambridge;* ***Mark Wilson,*** *Rolls-Royce*
5:00	GT2018:77011 **A New Type of Rotary Liquid Piston Pump for Multi-Phase CO2 Compression** ***Azam Thatte,*** *Energy Recovery*	GT2018:76159 **The Influence of Different Endwall Contouring Locations on the Second Flow Losses in a Highly Loaded Low Pressure Turbine** ***Wenhua Duan, Weiyang Qiao, Zuo-Jun Wei, Jian Liu, Haoyi Cheng,*** *Northwestern Polytechnical University*	GT2018:76155 **DEVELOPMENT OF A MULTI-OBJECTIVE PRELIMINARY DESIGN OPTIMIZATION APPROACH FOR AXIAL FLOW COMPRESSORS** ***Youwei He, Jinju Sun, Peng Song, Xuesong Wang, Da Xu,*** *Xi'an Jiaotong University*

MONDAY, JUNE 11 — 4:00 - 5:30 PM

	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY
	Surrogate-Assisted Approaches, Including Sampling and Data Mining	**Centrifugal Compressors: Secondary Flows & Losses**	**Flow Control and Smart Wind Turbines**
	Technical Session • E-2 • MC-46-03 Part B	**Technical Session • E-1 • MC-44-06 Part B**	**Tutorial Session • Hordaland • MC-48-07**
	Session Organizer: **Christian Voß,** German Aerospace Center (DLR) Session Co-Chair(s): **Christoph Starke**, Siemens	Session Organizer: **Hamid Hazby**, PCA Engineers Limited Session Co-Chair(s): **Liping Xu**, University of Cambridge	Session Organizer: **Christian Oliver** Paschereit, H.F.I TU Berlin
4:00	GT2018:76639 **Agile SBO Framework Exploiting Multisimulation Data: Optimising Efficiency and Stall Margin of a Transonic Compressor** ***Lieven Baert**, **Christophe Dumeunier**, **Michaël Leborgne**, **Caroline Sainvitu**, **Ingrid Lepot**, Cenaero*	GT2018:76330 **Numerical Study on Interaction of Tip Synthetic Jet with Tip Leakage Flow in Centrifugal Impeller** ***Wenlin Huang**, **Huijing Zhao**, **Zhiheng Wang**, **Guang Xi**, Xi'an Jiaotong University; **Haijun Liu**, Xi'an Shaangu Power Co. Ltd.*	GT2018:77595 **Flow Control and Smart Wind Turbines** ***Christian Oliver Paschereit**, H.F.I TU Berlin* **T U T O R I A L**
4:30	GT2018:76076 **Multi-Objective Optimization of Inclined Discrete Cavities in a Centrifugal Compressor Using Hybrid Optimization Techniques** ***Sang-Bum Ma**, **Kwang-Yong Kim**, Inha Univ*	GT2018:76837 **Tip Clearance Effects on Turbocharger Compressor Performance** ***RICHARD AMANKWA ADJEI**, **Weizhe Wang**, **Di Peng**, **Yingzheng Liu**, Shanghai Jiao Tong University; **Takahiro Bamba**, IHI Corporation*	
5:00	GT2018:76164 **Multi-Objective Optimization Design and Analysis of High-Turning Tandem Cascade** ***Zhaoyun Song**, **Bo Liu**, **Hao Cheng**, **Xiaochen Mao**, Northwestern Polytechnical University*	GT2018:75902 **A Study on Matching between Centrifugal Compressor Impeller and Low Solidity Diffuser and Its Extension to Vaneless Diffuser** ***Hideaki Tamaki**, IHI Corporation*	

MONDAY, JUNE 11 **4:00 - 5:30 PM**

4:00			
4:30			
5:00			

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	AIRCRAFT ENGINE	AIRCRAFT ENGINE	COAL, BIOMASS & ALTERNATIVE FUELS
	Combustion and Emissions	**Inlets II**	**Liquid Fuel Atomization and Combustion - Joint Session with Combustion, Fuels and Emissions Committee**
	Technical Session • Jan Mayen 2 • TA-1-03	**Technical Session • Jan Mayen 1 • TA-1-15**	**Tutorial Session • Nord-Norge • TA-3-04**
	Session Organizer: **Antonio Ficarella**, University of Salento Session Co-Chair(s): **Yoji Okita**, IHI Corporation	Session Organizer: **David Kidman**, U.S. Air Force Session Co-Chair(s): **Kevin Lowe**, Virginia Polytechnic and State University	Session Organizer: **Ajay Agrawal**, University of Alabama Session Co-Chair(s): **Adel Ben Mansour**, Parker Hannifin Corp.
8:00	GT2018:76195 **Throughflow Method for a Combustion Chamber with Effusion Cooling Modelling** ***Xiaoheng LIU**, Beihang University; **Donghai JIN**, Beihang University; **Xingmin GUI**, Beihang University*	GT2018:75793 **Passive Pressure Equalization Method for Flow Control in an S-duct Intake of Propulsion System with High Subsonic Flow** ***Stephen Pym**, **Asad Asghar**, **William Allan**, **Marc Laviolette**, Royal Military College Of Canada; **Robert Stowe**, DRDC Valcartier*	GT2018:77522 **Liquid fuel atomization and combustion** ***Ajay Agrawal**, University of Alabama* GT2018:77563 **Liquid Fuel Atomization and Combustion** ***Adel Ben Mansour**, Parker Hannifin Corp*
8:30	GT2018:75510 **Assessment of CO_2 and NOx Emissions in Intercooled Pulsed Detonation Turbofan Engines** ***Carlos Xisto**, **Olivier Petit**, **Tomas Grönstedt**, Chalmers University of Technology; **Anders Lundbladh**, GKN Aerospace*	GT2018:76636 **Investigation of a Passive Flow Control Device in an S-duct Inlet of a Propulsion System with High Subsonic Flow** ***Asad Asghar**, **Satpreet S. Sidhu**, **William Allan**, Royal Military College Of Canada; **Grant Ingram**, **Thomas Hickling**, Durham University; **Robert Stowe**, DRDC Valcartier*	**T U T O R I A L**
9:00		GT2018:76661 **S-duct Diffuser Offset-to-Length Ratio Effect on Aerodynamic Performance of Propulsion-System Inlet of High Speed Aircraft** ***Asad Asghar**, **William Allan**, **Marc Laviolette**, Royal Military College Of Canada; **Robert Stowe**, DRDC Valcartier; **Derrick Alexander**, Lloyd's Register; **Grant Ingram**, Durham University*	
9:30		GT2018:76616 **Turbofan Nose Cone Interactions with Inlet Swirl** ***Dustin Frohnapfel**, **Elizabeth Mack**, **Alexandrina Untaroiu**, **Kevin Lowe**, **Walter Obrien**, Virginia Polytechnic and State University*	

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Combustion Dynamics Tutorial	**Atomization & Sprays I**	**Fundamental Combustion I**
	Tutorial Session • A1-2 • TA-4-38	**Technical Session • Jan Mayen 3 • TA-4-12**	**Technical Session • A1-1 • TA-4-27**
	Session Organizer: **Tim Lieuwen**, Georgia Institute of Technology	Session Organizer: **Vincent McDonell,** University Of California Session Co-Chair(s): **Brandon A. Sforzo**, Argonne National Laboratory	Session Organizer: **Lei-Yong Jiang,** National Research Council Session Co-Chair(s): **Rory Monaghan,** National University of Ireland Galway; **Yinghua Han**, NRCC
8:00	GT2018:77374 **Combustion Dynamics** ***Tim Lieuwen**, Georgia Institute of Technology*	GT2018:75603 **Study on the Effect of Jets Geometry in Liquid Atomization Based on Nonlinear Stability Analysis** ***Sajad Jafari,** Sharif University; **Taravatsadat Nehzati**, Norwegian University of Science and Technology*	GT2018:76841 **Combustion Characteristics of Isolated Free-falling Droplets of Jet A blended with Ethanol and Butanol** ***Alvaro Muelas**, **Pilar Remacha,** Laboratory for Research on Fluid Dynamics and Combustion Technologies (LIFTEC); **Javier Ballester**, University of Zaragoza*
8:30	**T U T O R I A L**	GT2018:75195 **Modeling Near Critical and Supercritical Fuel Injection and Mixing in Gas Turbine Applications** ***Claudio Lettieri,** Delft University of Technology; **Georgi Subashki**, **Zoltan Spakovszky**, Massachusetts Institute of Technology*	GT2018:76914 **Measurements of periodic Reynolds stress oscillations in a forced turbulent premixed swirling flame** ***Christopher Douglas**, **Jamie Lim**, **Travis Smith**, **Benjamin Emerson**, **Tim Lieuwen,** Georgia Institute of Tech; **Naibo Jiang**, **Christopher Fugge**r, **Tongxun Yi**, **Josef Felver**, **Sukesh Roy,** Spectral Energies, LLC; **James Gord**, Air Force Research Laboratory*
9:00		GT2018:76452 **EXPERIMENTAL INVESTIGATION OF SPRAY AND COMBUSTION PERFORMANCES OF A FUEL-STAGED LOW EMISSION COMBUSTOR PART II: EFFECTS OF VENTURI ANGLE** ***Cunxi Liu**, **Fuqiang Liu**, **Jinhu Yang**, **Yong Mu**, **Gang Xu,** Institute of Engineering Thermophysics, Chinese Academy of Sciences*	GT2018:77018 **Measurements of the reactivity of premixed, stagnation, methane-air flames at gas turbine relevant pressures** ***Philippe Versailles**, **Antoine Durocher**, **Jeffrey Bergthorson,** McGill University; **Gilles Bourque**, Siemens Canada*
9:30		GT2018:75574 **Experimental and analytical characterization of alternative aviation fuel sprays under realistic operating conditions** ***Andrew Corber,** National Research Council of Canada; **Nader Rizk**, Roll Royce Corp; **Wajid Chishty**, NRC Aerospace*	GT2018:77139 **Fuel Variation Effects in Propagation and Stabilization of Turbulent Counter-flow Premixed Flames** ***Ehsan Abbasi-Atibeh**, **Jeffrey Bergthorson**, McGill University; **Sandeep Jella**, Siemens Canada*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	ELECTRIC POWER	HEAT TRANSFER: EXPERIMENTAL INTERNAL COOLING
	Measurement Techniques for Structural Health Monitoring	**Gas Turbine Analysis & Optimization**	**Special Topics**
	Technical Session • Event Room • TA-5-02	**Technical Session • Romerike • TA-8-02**	**Technical Session • A1-4 + A1-5 • TA-16-02**
	Session Organizer: **Lubomir Ribarov**, Pratt & Whitney	Session Organizer: **Bin Zhou**, FM Global	Session Organizer: **Nirm Nirmalan**, Consultant - GE Aviation Poland Session Co-Chair(s): **Robert Proctor**, GE Aviation
8:00	GT2018:75384 **Automated Condition Evaluation of Hot-Gas Path Components of Jet Engines through Exhaust Jet Analysis** ***Ulrich Hartmann**, Leibniz Universität Hannover; **Joerg Seume**, **Gottfried Wilhelm** Leibniz Universitaet*	GT2018:75764 **FlameSheet™ Combustor Extended Engine Validation for Operational Flexibility and Low Emissions** ***Hany Rizkalla, Fred Hernandez, Ramesh Keshava-Bhattu, Peter Stuttaford,** Power Systems Mfg., LLC An Ansoldo Energia Company*	GT2018:77073 **Turbine Vane Leading Edge Impingement Cooling With a Sweeping Jet** ***Lucas Agricola, Mohammad Arif Hossain, Ali Ameri, James Gregory, Jeffrey Bons**, Ohio State University*
8:30	GT2018:76406 **Measurement and evaluation of shaft torsional vibrations using shaft instantaneous angular velocity** ***Jindrich Liska**, **Jan Jakl**, **Sven Künkel,** University of West Bohemia*	GT2018:75214 **Optimal Design of Flexible Power Cycles through Kriging-Based Surrogate Models** ***Luca Riboldi,** NTNU; **Lars O. Nord**, Norwegian University of Science and Technology*	GT2018:75360 **Comparative experimental investigation of leading edge cooling concepts of turbine rotor blades** ***Maximilian Elfner, Achmed Schulz, Hans-Joerg Bauer,** Karlsruhe Institute of Technology (KIT); **Knut Lehmann**, Rolls-Royce*
9:00	GT2018:75224 **Gas Turbine Bearing Wear Monitoring Method Based on Magnetic Plug Inductance Sensor** ***Yunpeng Cao, Rui Liu, Qingcai Yang, Yinghui He, Shuying Li,** Harbin Engineering University; Jianwei Du, **Fang Yu,** China Ship Research and Development Academy*	GT2018:75435 **Economic Optimization of Inlet Air Filtration for Gas Turbines** ***Dale Grace**, Electric Power Research Institute; **Christopher A. Perullo,** Georgia Institute of Technology; **Jared Kee**, Turbine Logic*	GT2018:76409 **Three-dimensional Visualization of Flow Characteristics using a Magnetic Resonance Imaging (MRI) in a Lattice Cooling Channel** ***Tomoko Tsuru, Katsuhiko Ishida,** Kawasaki Heavy Industries, Ltd; **Junya Fujita**, **Kenichiro Takeishi**, Tokushima Bunri University*
9:30	GT2018:75643 **Verification and Design of High Precision Eddy Current Sensor for Tip Clearance Measurement** ***Zhao Ziyu, Yaguo Lyu, Zhenxia Liu, Xinxin Xu,** Northwestern Polytechnical University*	GT2018:75030 **Energy Innovation: A Focus on Power Generation Data Capture & Analytics in a Competitive Market** ***Salvatore Dellavilla**, Strategic Power Systems Inc*	GT2018:76551 **Application of the Transient Heat Transfer Measurement Technique Using TLC in a Network Configuration with Intersecting Circular Passages** ***Anika Steurer**, **Rico Poser**, **Jens von Wolfersdorf**, University of Stuttgart; **Stefan Retzko**, Ansaldo Energia Switzerland AG*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	HEAT TRANSFER: NUMERICAL FILM COOLING	INDUSTRIAL & COGENERATION
	Rim Seals 2	**General Numerical Simulation of Film Cooling**	**Gas Turbine Power Augmentation and Energy Storage Technologies**
	Technical Session • A1-6 • TA-15-06	**Technical Session • A1-3 • TA-12-02**	**Technical Session • Oslo • TA-23-01**
	Session Organizer: **Karen Thole**, Penn State University Session Co-Chair(s): **G.D. Lock,** University of Bath	Session Organizer: **James L. Rutledge,** Air Force Institute of Technology Session Co-Chair(s): **Stephen Lynch,** Penn State University	Session Organizer: **Mustapha Chaker,** CB&I Session Co-Chair(s)**: Francesco Melino,** University of Bologna
8:00	GT2018:75228 **Conjugate heat transfer analysis on generic rim seal configurations in rotor-stator system** ***Xingyun Jia, Qun Zheng, Hai Zhang, Yuting Jiang,*** *Harbin Engineering University;* ***Liguo Wang,*** *Beijing Power Machinery Institute*	GT2018:76222 **Numerical Investigation of film and impingement cooling schemes for gas turbine application** ***Lucilene Moraes da Silva,*** *Instituto Tecnológico de Aeronáutica;* ***Jesuino Takachi Tomita,*** *Technological Institute of Aeronautics - ITA/DCTA;* ***Cleverson Bringhenti,*** *Technological Institute of Aeronautics;* ***Tomas Gronstedt,*** *Chalmers University*	GT2018:75216 **POWER TO ICE: A NOVEL APPROACH TO STABILIZE NON-PROGRAMMABLE RENEWABLE BY MEANS OF GAS TURBINE IACC** ***Francesco Melino, Maria Alessandra Ancona, Michele Bianchi, Lisa Branchini, Andrea Depascale, Alessandro Brilloni,*** *University of Bologna;* ***Antonio Peretto,*** *Diem-facolta Inegneria*
8:30	GT2018:75712 **Effect of Rim Seal Configuration on Gas Turbine Cavity Sealing in Both Design and Off-Design conditions** ***Riccardo Da Soghe, Cosimo Bianchini, Jacopo D'Errico, Mirko Micio,*** *Ergon Research s.r.l;* ***Francesco Bavassano,*** *Ansaldo Energia*	GT2018:75686 **Uncertainty Quantification Analysis of Back Facing Steps Film Cooling Configurations** ***Eiji Sakai, Criepi, Meng Bai, Richard Ahlfeld, Francesco Montomoli,*** *Imperial College London*	GT2018:75428 **Inlet Air Filter Elements Site and Laboratory Tests of Four different Manufacturers** ***Steve Ingistov,*** *TESORO/WCC; Joshua Kohn, Camfil*
9:00	GT2018:76978 **Heat Transfer and Pressure Measurements for the Forward Purge Cavity, Inner Endwall, and Rotor Platform of a Cooled Transonic Turbine Stage** ***Jeremy Nickol,*** *ETH Zurich;* ***Matthew Tomko, Randall Mathison,*** *The Ohio State University;* ***Jong-shang Liu, Mark Morris, Malak Malak,*** *Honeywell International*	GT2018:76170 **Effects of Density and Blowing Ratios on the Turbulent Structure and Effectiveness of Film-Cooling** ***Zachary Stratton,*** *Tom Shih, Purdue University*	GT2018:76544 **Experimental Investigation Of Droplet's Splashing With Varying Pressures And Impact Angles To Predict Behaviour During Wet Compression** ***Jascha Broder, Christoph Gunther, Franz Joos,*** *Helmut Schmidt University / University of the Federal Armed Forces Hamburg*
9:30			GT2018:76688 **Optimal Operation of a Gas Turbine Cogeneration Unit with Energy Storage for Wind Power System Integration** ***Thomas Bexten, Manfred Wirsum, Bjoern Roscher, Ralf Schelenz, Georg Jacobs, Peter Franz Jeschke,*** *RWTH Aachen University;* ***Daniel Weintraub,*** *Institute of Jet Propulsion and Turbomachinery*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	MANUFACTURING MATERIALS & METALLURGY	OIL & GAS APPLICATIONS	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
	Additive Manufacturing Properties	**LNG and Off-Shore Applications**	**Gas Bearings 3**
	Technical Session • Svalbard • TA-24-02	**Technical Session • Sør-Norge• TA-27-07**	**Technical Session • E-6 • TA-34-05**
	Session Organizer: **Dheepa Srinivasan**, GE Power, GE India Technology Center Session Co-Chair(s): **Victor Correia**, GE Aviation	Session Organizer: **Mirko Morini**, University of Parma	Session Organizer: **Ilmar Ferreira Santos**, Technical University of Denmark
8:00	GT2018:75870 **Structure and Mechanical Properties of Laser Beam and Wide Gap Brazed Joints Produced Using Mar M247 - Amdry DF3 Powders** ***Alex Gontcharov**, Liburdi Turbine Services; **Yuan Tian**, Liburdi; **Paul Lowden**, Liburdi Engineering Ltd; **Mathieu Brochu**, McGill University*	GT2018:75003 **On Gas Turbine Safety in Offshore Operations** ***Rainer Kurz, Robert Mendoza, Daniel Burnes, Sean Alexander, Priyank Saxena**, Solar Turbines Incorporated*	GT2018:75340 **On the design, manufacture and premature failure of a metal mesh foil thrust bearing - how concepts that work on paper, actually do not.** ***Travis Cable, Luis San Andres**, Texas A&M University*
8:30	GT2018:75978 **Investigating Discrepancies in Bending Fatigue Behavior of Additively Manufactured Titanium 6Al-4V** ***Onome Scott-Emuakpor, Tommy George, Luke Sheridan, Emily Carper**, Air Force Research Laboratory; **Casey Holycross**, Aerospace Systems Directorate AFRL; **Joseph Beck**, Perceptive Engineering Analytics LLC*	GT2018:75370 **HEAT RECOVERY FROM A LIQUEFIED NATURAL GAS PRODUCTION PROCESS BY MEANS OF AN ORGANIC RANKINE CYCLE** ***Maria Alessandra Ancona, Michele Bianchi, Lisa Branchini, Andrea Depascale, Francesco Melino, Saverio Ottaviano, Luigi Benedetto Scarponi**, University of Bologna; **Antonio Peretto**, Diem-facolta Inegneria*	GT2018:75595 **Evaluation of Coated Top Foil Bearings: Dry Friction, Drag Torque, and Dynamic Force Coefficients** ***Luis San Andres**, Texas A&M; **Wonbae Jung**, **KeyYang** Precision/Texas A&M University*
9:00	GT2018:76831 **Torsional Response of Additively Manufactured Steel under Monotonic and Cyclic Conditions** ***SANNA SIDDIQUI, Ali Gordon**, Univ Of Central Florida; **Abiodun Fasoro**, Central State University*	GT2018:75567 **Aeroderivative Engines in LNG Liquefaction Mechanical Drive Applications** ***Cyrus Meher-Homji, Matt Taher, Feroze Meher-Homji, Pradeep Pillai**, Bechtel Corporation*	GT2018:76204 **Design Characteristics of an Aerodynamic Foil Bearing with Adaptable Bore Clearance** ***Hossein Sadri, Henning Schlums, Michael Sinapius**, TU Braunschweig*
9:30		GT2018:75628 **Learning from Success Mixing Different Brands of Turbomachinery Lube Oil ISO VG32 at Badak LNG Plant Bontang** ***Achmad Junaedi**, Badak LNG*	GT2018:75983 **EFFECT OF CIRCUMFERENTIAL LOCATION OF RADIAL INJECTION ON ROTORDYNAMIC PERFORMANCE OF HYBRID AIR FOIL BEARINGS** ***Behzad Zamanian Yazdi**, Energy Recovery Inc; **Daejong Kim**, University of Texas at Arlington*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	STRUCTURES & DYNAMICS: ROTORDYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	STUDENT ADVISORY
	Rotordynamics II - Model Improvements 1	**Mistuning III**	**Contributing to Scientific Advancement: Fundamentals on how to Craft an Effective Paper Review**
	Technical Session • E-8 • TA-33-02	**Technical Session • E-7 • TA-35-03**	**Tutorial Session • Hall B4 • TA-37-01**
	Session Organizer: **Dierk Otto,** Rolls Royce Deutschland Ltd & Co KG Session Co-Chair(s): **Thomas Thummel**, Technical University of Munich	Session Organizer: **Christian M. Firrone,** Politecnico di Torino Session Co-Chair(s): **Kiran D'Souza,** The Ohio State University	Session Organizer: Point Contact: **Zhiping Mao,** Duke University Session Co-Chair(s): **Wisher Paudel**, University of Virginia
8:00	GT2018:75005 **Unconventional Techniques for the Analysis of Experimental Spiral Vibrations** ***Andrea Vania, Paolo Pennacchi, Steven Chatterton,*** *Politecnico di Milano;* ***Filippo Cangioli****, Waukesha Bearings*	GT2018:75514 **Investigations on transient amplitude amplification by applying intentional mistuning** ***Klaus-Dieter Schlesier,*** *Institute of Dynamics and Vibration Research;* ***Lars Panning-von Scheidt, Joerg Wallaschek****, Leibniz Universitat Hannover;*	GT2018:77506 **Contributing to Scientific Advancement: Fundamentals on how to Craft an Effective Paper Review** ***Piero Colonna,*** *Delft University of Technology*
8:30	GT2018:75101 **A SIMPLE CONTACT MODEL FOR SIMULATING TIE BOLT ROTOR BUTT JOINTS WITH AND WITHOUT PILOT FITS** ***Aaron Rimpel****, Southwest Research Institute*	GT2018:76584 **Forced Response Reduction of a Blisk by Means of Intentional Mistuning** ***Bernd Beirow, Arnold Kuehhorn, Felix Figaschewsky, Brandenburg*** *University of Technology Cottbus-Senftenberg;* ***Alfons Bornhorn****, MAN Diesel SE;* ***Oleg V. Repetckii,*** *Irkutsk State Agrarian University*	**T U T O R I A L**
9:00	GT2018:75144 **Rotor System Mathematical Model Substructure-Based Reduction And Updating Using Experimental Modal Analysis** ***Sergei Semenov, Mikhail Nikhamkin, Nikolai Sazhenkov,*** *Perm National Research Polytechnic University*	GT2018:76601 **Intentional Response Reduction by Harmonic Mistuning of Bladed Disks With Aerodynamic Damping** ***Sebastian Willeke, Lukas Schwerdt, Lars Panning-von Scheidt, Joerg Wallaschek,*** *Leibniz Universitat Hannover*	
9:30			

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS
	Supercritical CO2 Turbomachinery	**Design Concepts**	**End-Wall Flows & Passage Contouring**
	Technical Session • Akershus • TA-38-01	**Technical Session • E-5 • TA-39-06**	**Technical Session • E-3 • TA-39-09**
	Session Organizer: **Timothy Allison**, Southwest Research Institute	Session Organizer: **Kenneth Suder**, NASA Glenn Research Center	Session Organizer: **Martin G. Rose**, Thermo-Fluid Mechanics Research Centre (TFMRC), University of Sussex Session Co-Chair(s): **Eberhard Nicke**, DLR German Aerospace Center
8:00	GT2018:75154 **Turbomachine design for supercritical carbon dioxide within the sCO2-HeRo.eu project** ***Alexander J. Hacks, Sebastian Schuster, Hans Josef Dohmen, Friedrich-karl Benra, Dieter Brillert,*** *University of Duisburg-Essen*	GT2018:75489 **Aerodynamic optimization of a two-part variable inlet guide vane in a highly loaded low pressure compressor** ***Stefan Hemmert-Pottmann, William Gouezou, Eberhard Nicke,*** *DLR German Aerospace Center*	GT2018:75936 **Research on the applicability of using curved blade to optimize the flow losses weight distribution of a linear compressor cascade with different flow separation types** ***Xiaoxu Kan, Songtao Wang, Lei Luo, Jiexian Su,*** *Harbin Institute of Technology*
8:30	GT2018:75356 **Small Scale Supercritical CO2 Radial Inflow Turbine Meanline Design Considerations** ***Tina Unglaube, Hsiao-Wei D. Chiang,*** *National Tsing Hua University*	GT2018:76826 **Aerodynamic And Experimental Investigations On Optimized 3D Compressor Airfoils AIRFOILS** ***Jan Mihalyovics, Christian Brueck,*** *TU Berlin;* ***Marcus Meyer, Ilias Vasilopoulos,*** *Rolls-Royce Deutschland;* ***Dieter Peitsch,*** *Technische Universitaet Berlin*	GT2018:76048 **The Use of Blended Blade and End Wall in Compressor Cascade: Optimization Design and Flow Mechanism** ***JiaBin Li, Lucheng Ji, Weilin YI,*** *Beijing Insititute of Technology*
9:00	GT2018:76019 **Axial Force Balance of Supercritical CO2 Radial Inflow Turbine Impeller Through Backface Cavity Design** ***Can Ma, Zhiqiang Qiu, Jinlan Gou, Jun Wu, Zhenxing Zhao, Wei Wang,*** *Wuhan Second Ship Design and Research Institute*	GT2018:77039 **ASSESSMENT OF A NOVEL NON-AXIAL COUNTER-ROTATING COMPRESSOR CONCEPT FOR AERO-ENGINES** ***Quentin Dejour, Huu Duc Vo,*** *Ecole Polytechnique de Montreal*	GT2018:76247 **Effect of Solidity on Non-Axisymmetric Endwall Contouring Performance in Compressor Linear Cascades** ***Xiwu LIU, Donghai JIN, Xingmin GUI, Xiaoheng LIU, Hanwen GUO,*** *Beihang University*
9:30		GT2018:76383 **Investigation of the Dihedral Angle Effect on the Boundary Layer Development Using Special-Shaped Expansion Pipes** ***Fei Teng, Lucheng Ji, Weilin YI,*** *Beijing Insititute of Technology*	GT2018:76480 **Flow Structure and Unsteady Behavior of Hub-Corner Separation in a Stator Cascade of a Multi-Stage Transonic Axial Compressor** ***Seishiro Saito, Kazutoyo Yamada, Masato Furukawa, Keisuke Watanabe,*** *Kyushu University;* ***Akinori Matsuoka, Naoyuki Niwa,*** *Kawasaki Heavy Industries, Ltd.*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DEPOSITION, EROSION, FOULING, AND ICING	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Aerodynamic Studies III	**Deposition Modeling - I**	**Unsteady Flows in Turbines IV**
	Technical Session • E-4 • TA-41-11	**Technical Session • E-2 • TA-47-04**	**Technical Session • E-1 • TA-45-05**
	Session Organizer: **Sung in Kim**, Queen's University Belfast Session Co-Chair(s): **Alexander Stein,** GE Power	Session Organizer: **Christian Koch**, Institute For Aircraft Propulsion Systems, University of Stuttgart Session Co-Chair(s): **Eric Ruggiero,** GE Aviation	Session Organizer: **Nateri K., Madavan,** NASA Ames Research Center Session Co-Chair(s): **Florian Herbst**, Leibniz Univ Hannover
8:00	GT2018:76879 **Turbopump Booster Turbine Performance: Comparison Between Monophase and Multiphase Flows Using CFD** ***Luiz Henrique Lindquist Whitacker,*** *Aeronautics Institute of Technology****; Jesuino Takachi Tomita, Cleverson Bringhenti,*** *Technological Institute of Aeronautics*	GT2018:75723 **Review of Heated Sand Particle Deposition Models** ***Kwen Hsu, Brett Barker, Bruce Varney,*** *Rolls-Royce Corporation;* ***Andrew Boulanger, Vy Nguyen, Wing Ng,*** *Virginia Tech*	GT2018:75307 **Numerical Investigation of the Compressible Flow through a Turbine Center Frame Duct** ***Li-Wei Chen, Chris Wakelam,*** *GE Global Research;* ***Jonathan Ong,*** *GE;* ***Andreas Peters, Andrea Milli,*** *GE Aviation;* ***Vittorio Michelassi,*** *Baker Hughes a GE company*
8:30	GT2018:77105 **Scaling Sealing Effectiveness in a Stator-Rotor Cavity for Differing Blade Spans** *Reid A. Berdanier, Ivan Monge-Concepcion, Brian Knisely, Mike Barringer, Karen Thole, Penn State University; Eric Grover, Pratt & Whitney*	GT2018:76882 **An Innovative Approach Towards Fouling Modeling: Microscale Deposition Pattern and its Effect on the Flow Field** *Nicola Casari, Michele Pinelli, Alessio Suman, University of Ferrara*	GT2018:75596 **Full-Annulus URANS Study of Inlet Hot Streak Transportation in a Four-Stage Gas Turbine** ***Zhongran Chi, Haiqing Liu, Shusheng Zang,*** *Shanghai Jiao Tong University;* ***Chengxiong Pan, Meibao Zhang,*** *Shanghai Electric Gas Turbine Co., Ltd.*
9:00	GT2018:76615 **Numerical study of a linear cascade with upstream cavity using various rim-seal geometries and purge rates** *Maxime Fiore, Nicolas Gourdain, Jean-Francois Boussuge, CERFACS, ISAE; Eric Lippinois, Safran Aircraft Engine*	GT2018:76934 **Gas Turbine Fouling Tests: Review, Critical Analysis and Particle Impact Behavior Map** *Alessio Suman, Nicola Casari, Elettra Fabbri, Michele Pinelli, University of Ferrara; Luca Di Mare, University of Oxford; Francesco Montomoli, Imperial College London*	GT2018:76459 **Transport of entropy waves within a HP gas turbine stage** ***Paolo Gaetani, Giacomo Persico,*** *Politecnico Di Milano*
9:30	GT2018:76827 **Shrouded CMC Rotor Blades for High Pressure Turbine Applications** *Robert Boyle, Ankur Parikh, Vinod Nagpal, N&R Engineering; Lucas Agricola, Ali Ameri, Ohio State University*	GT2018:76774 **On deposit sintering and detachment from gas turbines** *Nicola Casari, Michele Pinelli, Alessio Suman, University of Ferrara; Luca Di Mare, University of Oxford; Francesco Montomoli, Imperial College London*	GT2018:77012 **Numerical analysis of an instrumented turbine blade cascade** ***Bryn Ubald, Jiahuan Cui, Rob Watson, Paul G. Tucker,*** *University of Cambridge;* ***Shahrokh Shahpar,*** *Rolls-Royce plc*

TUESDAY, JUNE 12 — 8:00 - 10:00 AM

WIND ENERGY

Blade and Airfoil Aerodynamics

Technical Session • Hordaland • TA-48-01

Session Organizer: **Kenneth Van Treuren**, Baylor University
Session Co-Chair(s): **Giacomo Persico**, Politecnico Di Milano

8:00

GT2018:76514
Experimental Analysis of a NACA 0021 Airfoil Under Dynamic Angle of Attack Variation and Low Reynolds Numbers
David Holst, Benjamin Church, Felix Wegner, George Pechlivanoglou, Christian Navid Nayeri, Christian Oliver Paschereit, *H.F.I TU Berlin*

8:30

GT2018:75426
Static and Dynamic Analysis of a NACA 0021 Airfoil Section at Low Reynolds Numbers Based on Experiments and CFD
David Holst, Benjamin Church, Felix Wegner, George Pechlivanoglou, Christian Navid Nayeri, Christian Oliver Paschereit, *H.F.I TU Berlin;* ***Francesco Balduzzi, Alessandro Bianchini, Giovanni Ferrara****, University of Florence;* ***Lorenzo Ferrari,*** *University of Pisa - DESTEC*

9:00

GT2018:75029
Design and test campaign of a ducted horizontal axis wind turbine
Massimo Rivarolo, Andrea Freda, Alessandro Spoladore, Alberto Traverso, *University of Genoa;* ***Carlo Cravero,*** *Università Degli Studi Di Genova;* ***Stefano Torrielli, Marco Gualco,*** *ASI srl;* ***Enrico Valditerra****, Societa Borgovecchio Srl*

9:30

GT2018:76664
Numerical investigation into the energy extraction characteristics of parallel dual-foil turbine
Wei Jiang, Di Zhang, Yulu Wang*, Xi'an Jiaotong University;* ***Yonghui Xie,*** *Inst of Turbomachinery*

KEYNOTE & PLENARIES

Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts

Plenary Session • Hall B4 • 50-02

10:15 - 11:10 AM

Session Organizer: **Henry Bernstein**, Gas Turbine Materials Assoc

GT2018:77558
Pratt and Whitney Perspective
***Michael Winter**, Pratt and Whitney*

GT2018:77559
MHPS Perspective
***Masahito Kataoka**, MHPS*

GT2018:77560
Siemens Perspective
***Markus Seibold**, Siemens*

TUESDAY, JUNE 12 — 11:15 AM - 12:45 PM

	AIRCRAFT ENGINE	AIRCRAFT ENGINE	COAL, BIOMASS & ALTERNATIVE FUELS
	Inlets	**Propellers and Open Rotors**	**Alternative Fuel Use in Gas-Turbine Engines**
	Technical Session • Jan Mayen 2 • TB-1-05	**Technical Session • Jan Mayen 1 • TB-1-07**	**Technical Session • Nord-Norge • TB-3-03**
	Session Organizer: **Bruce Bouldin**, Honeywell Aerospace Session Co-Chair(s): **Ashlie Flegel,** NASA Glenn Research Center	Session Organizer: **John Spyropoulos,** NAVAIR/ Propulsion & Power Session Co-Chair(s): **Richard-Gregor Becker**, German Aerospace Center (DLR)	Session Organizer: **Michael Mueller,** Princeton University Session Co-Chair(s): **Pierre Gauthier**, Siemens Energy Canada
11:15	GT2018:76398 **Analysis and Testing of an Aerobatic Turboprop Aircraft Inlet** ***Pierre-Jean Faltot, Daniela Pitel Welnitz, Luca Lombardi, Philippe Vertenoeuil, Michele D'Ercole, Tomas Vlach,*** *GE Aviation*	GT2018:76183 **Effect of Aft Rotor on Forward Rotor Blade Wakes in Open Rotor Propulsion System** ***Charles Delorenzo, Jared Deleon, Paul Slaboch,*** *University of Hartford*	GT2018:76759 **Challenges and solutions for utilization of bioliquids in microturbines** ***Tine Seljak, Klemen Pavalec, University of Ljubljana; Marco Buffi,*** *RE-CORD/University of Florence;* ***Agustin Valera-Medina****, Cardiff University;* ***David Chiaramonti****, CREAR, Industrial Engineering Department, University of Florence;* ***Tomaz Katrasnik,*** *Faculty Of Mechanical Engineering*
11:45	GT2018:75872 **Numerical Modelling of Shock Wave Boundary Layer Interactions in Aero-engine Intakes at Incidence** ***Hardeep Kalsi, Paul G. Tucker,*** *University of Cambridge*	GT2018:75973 **NEAR AND FAR FIELD NOISE DECAY FROM A QUADCOPTER PROPELLER WITH AND WITHOUT A LEADING EDGE NOTCH** ***Kenneth Van Treuren,*** *Baylor University;* ***Charles Wisniewski,*** *Wisniewski Enterprises* ***Emily Cinnamon,*** *Baylor University*	GT2018:76856 **Environmental impact on the life cycle for turbine based biomass CHP plants** ***Pietro Bartocci, Gianni Bidini, Paolo Laranci, Mauro Zampilli, Michele D'Amico, Francesco Fantozzi,*** *University of Perugia*
12:15	GT2018:75090 **A Mixed-fidelity Numerical Study for Fan-distortion Interaction** ***Yunfei Ma, Jiahuan Cui, Nagabhushana Rao Vadlamani, Paul G. Tucker,*** *University of Cambridge*		GT2018:75198 **Performance Assessment of an Integrated Gasification Combined Cycle under Flexible Operation** ***Silvia Ravelli, Antonio Perdichizzi,*** *University of Bergamo*

TUESDAY, JUNE 12 — 11:15 AM - 12:45 PM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Combustor Diagnostics	**Combustion Dynamics: Basic Mechanism**	**Ignition & Auto-Ignition I**
	Technical Session • Jan Mayen 3 • TB-4-08	**Technical Session • A1-1 • TB-4-14**	**Technical Session • A1-2 • TB-4-26**
	Session Organizer: **Bhupendra Khandelwal,** Univ of Sheffield	Session Organizer: **Santosh Hemchandra,** Department of Aerospace Engineering Session Co-Chair(s): **Baris Sen,** Pratt & Whitney	Session Organizer: **Subith Vasu**, University of Central Florida Session Co-Chair(s): **Scott Martin**, Embry-Riddle Aeronautical University
11:15	GT2018:75424 **First Demonstration of an Acousto-Optically Modulated Quantum Cascade Laser as a Broadband, Time-Resolved Combustion Diagnostic** ***Zachary Loparo, Andrey Muraviev, Pedro Figueiredo, Arkadiy Lyakh, Robert Peale, Kareem Ahmed, Subith Vasu,*** *University of Central Florida*	GT2018:77051 **Feature Extraction from Time Resolved Reacting Flow Data Sets** ***Hanna M. Ek, Ianko P Chterev, Nicholas A. Rock, Benjamin Emerson, Jerry M. Seitzman, Tim Lieuwen,*** *Georgia Institute of Technology;* ***Naibo Jiang,*** *Spectral Energies, LLC;* ***William Proscia,*** *Pratt & Whitney*	GT2018:75420 **Investigation of Extinction and Reignition Events using the Flamelet Generated Manifold Model** ***Hossam Elasrag, Shaoping Li,*** *ANSYS Inc.*
11:45	GT2018:77255 **OH• CHEMILUMINESCENCE IMAGING OF THE COMBUSTION PRODUCTS FROM A METHANE-FUELED ROTATING DETONATION ENGINE** *Jonathan Tobias, Daniel Depperschmidt, Robert Miller, Cooper Welch, Mruthunjaya Uddi, Ajay Agrawal, University of Alabama; Ron Daniel Jr, Aerojet Rocketdyne*	GT2018:76952 **Simultaneous 10-khz formaldehyde-PLIF, OH-PLIF, and PIV measurements on a confined, bluff-body stabilized flame** ***Christopher Fugger,*** *Spectral Energies, LLC;* ***Andrew Caswell, Brent Rankin, James Gord,*** *Air Force Research Laboratory*	GT2018:76624 **IGNITION DYNAMICS IN AN ANNULAR COMBUSTOR WITH GYRATORY FLOW MOTION** ***Wang Gaofeng, Ye Chenran, Yuanqi Fang, Liang Zhong, Chengbiao Ma,*** *Zhejiang University;* ***Stephane Moreau,*** *Universite de Sherbrooke*
12:15	GT2018:75201 **TOMOGRAPHIC PIV IN THE NEAR FIELD OF A SWIRL-STABILISED FUEL INJECTOR** ***Adrian Spencer, Mark Brend, David Dunham, Daniel Butcher, Liangta Cheng,*** *Loughborough University;* ***Dave Hollis,*** *LaVision UK*	GT2018:75304 **Jet-oscillation-induced combustion dynamics in a multi-nozzle FLOX« combustor** ***Zhiyao Yin, Peter Kutne, Isaac Boxx, Wolfgang Meier,*** *German Aerospace Center (DLR)*	GT2018:77196 **Fuel Composition Effects on Forced Ignition of Liquid Fuel Sprays** ***Sheng Wei, Jerry M. Seitzman,*** *Georgia Institute of Technology;* ***Brandon A. Sforzo,*** *Argonne National Laboratory*

TUESDAY, JUNE 12 — 11:15 AM - 12:45 PM

	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	ELECTRIC POWER	HEAT TRANSFER: CONJUGATE HEAT TRANSFER
	Performance Monitoring and Fault Diagnostics of Gas Turbines	**Combined Cycle Advancements**	**Conjugate Heat Transfer I**
	Technical Session • Event Room • TB-5-03	**Technical Session • Romerike • TB-8-01**	**Technical Session • A1-4 + A1-5 • TB-10-01**
	Session Organizer: **Igor Loboda,** Instituto Politecnico Nacional Session Co-Chair(s): **David Doel**, General Electric	Session Organizer: **Richard Dennis**, US Dept Of Energy	Session Organizer: **G.D. Lock,** University of Bath Session Co-Chair(s): **Todd Ebert,** Siemens Energy, Inc
11:15	GT2018:76961 **Multi-Level Neural Network Based Gas Turbine Modeling** ***Feipeng Zhao, Arindam Dasgupta, Chao Yuan, Amit Chakraborty,*** *Siemens Corporation*	GT2018:75768 **HRSG Duct Firing Revisited** ***Seyfettin Can Gulen,*** *Bechtel Infrastructure & Power Inc.*	GT2018:75740 **Fast conjugate heat transfer simulation of long transient flexible operations using adaptive time stepping** ***Roberto Maffulli, Li He,*** *University of Oxford;* ***Peter Stein,*** *HTWG KONSTANZ;* ***Gabriel Marinescu,*** *General Electric - Switzerland*
11:45	GT2018:75492 **Fuzzy Analytic Hierarchy Process Evaluation Method of Gas Turbine Based on Health Degree** ***Yunpeng Cao, Pan Hu, Qingcai Yang, Yinghui He, Shuying Li,*** *Harbin Engineering University;* ***Fang Yu, Jianwei Du,*** *China Ship Research and Development Academy*	GT2018:76911 **ADVANCEMENTS IN H CLASS GAS TURBINES AND COMBINED CYCLE POWER PLANTS** ***Christian Vandervort,*** *GE Power*	GT2018:76162 **Numerical Study on Analogy Principle of Overall Cooling Effectiveness in Engine and Laboratory Condition** ***Gang Xie, Cunliang Liu, Lin Ye, Rui Wang,*** *Northwestern Polytechnical University*
12:15	GT2018:75229 **Automated Gas Turbine Sensor Fault Diagnostics** ***Gbanaibolou Jombo, Yu Zhang, Jonathan Griffiths,*** *University of Lincoln;* ***Anthony Latimer,*** *Siemens Industrial Turbomachinery Limited*	GT2018:76989 **Exergoeconomic Analysis of a Triple-level Pressure Combined Cycle with Supplementary Firing** ***Edgar Vicente Torres Gonzalez, Raul Lugo Leyte, Martin Salazar Pereyra, Helen Denise Lugo Mendez, Juan Jose Ambriz Garcia,*** *Universidad Autonoma Metropolitana - Iztapalapa*	GT2018:75649 **Conjugate Heat Transfer Methodology For Thermal Design And Verification Of Gas Turbine Cooled Components** ***Lorenzo Winchler, Antonio Andreini, Bruno Facchini,*** *University of Florence;* ***Luca Andrei, Alessio Bonini, Luca Innocenti, Baker Hughes,*** *a GE Company*

	HEAT TRANSFER: EXPERIMENTAL INTERNAL COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	INDUSTRIAL & COGENERATION
	Passages with Enhancement Features	**Rim Seals 3**	**New Frontiers and Challenges in Polygeneration Grids**
	Technical Session • A1-3 • TB-16-03	**Technical Session • A1-6 • TB-15-07**	**Tutorial Session • Oslo • TB-23-10**
	Session Organizer: **Randall Mathison**, The Ohio State University Session Co-Chair(s): **SANJAY CHOPRA**, GE AVIATION	Session Organizer: **John Chew**, University of Surrey Session Co-Chair(s): **Sebastiaan Bottenheim,** Rolls-Royce plc	Session Organizer: **Lisa Branchini,** University of Bologna Session Co-Chair(s): **Maria Alessandra Ancona, Francesco Melino, Andrea Depascale,** University of Bologna; **Mirko Morini**, University of Parma
11:15	GT2018:76741 **EXPERIMENTAL AND NUMERICAL INVESTIGATION OF THE FLOW IN A TRAILING EDGE RIBBED INTERNAL COOLING PASSAGE** ***SeungChan Baek, Sangjoon Lee, Wontae Hwang,*** *Seoul National University;* ***Jung Shin Park,*** *Doosan Heavy Industries & Construction*	GT2018:75071 **Influence of leakage flows on hot gas ingress** ***Marios Patinios, Irvin Ong, James Scobie, G.D. Lock, Carl Sangan,*** *University of Bath*	GT2018:77448 **New frontiers and challenges in polygeneration grids** ***Lisa Branchini, Maria Alessandra Ancona, Francesco Melino, Andrea Depascale,*** *University of Bologna;* ***Mirko Morini****, University of Parma*
11:45	GT2018:75578 **Heat Transfer and Pressure Drop in a Converging Pedestal Array with Exit Area Variation** ***Loren Soma, Forrest Ames,*** *Univ Of North Dakota;* ***Sumanta Acharya****, Illinois Institute of Technology*	GT2018:75321 **Unsteady computation of ingress through turbine rim seals** ***Josh Horwood, Fabian Hualca, James Scobie, Carl Sangan, Mike Wilson, G.D. Lock,*** *University of Bath*	TUTORIAL
12:15	GT2018:75156 **Investigations on the Heat Transfer and Flow Characteristics in a Trapezoid Duct for Turbine Blade Leading Edge** ***Haiyong Liu, Cunliang Liu, Lin Ye,*** *Northwestern Polytechnical University*	GT2018:77055 **Hot Gas Ingestion Model Employing Flow Network with Axisymmetric Solvers** ***Yong Kim, Mike Okpara, Hans Hamm, Solar Turbines; Hee-Koo Moon****, Yonsei University;* ***Ramendra P Roy****, Arizona State University*	

TUESDAY, JUNE 12

11:15 AM - 12:45 PM

	MANUFACTURING MATERIALS & METALLURGY	OIL & GAS APPLICATIONS	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
	Additive Manufacturing Products	**Compressor Dynamics**	**Gas Bearings 4**
	Technical Session • Svalbard • TB-24-03	**Tutorial Session • Sør-Norge• TB-27-11**	**Technical Session • E-6 • TB-34-06**
	Session Organizer: **Sascha Gierlings,** Fraunhofer IPT Session Co-Chair(s): **Robin J. Day,** RWTH Aachen University - Digital Additive Production	Session Organizer: **Rainer Kurz,** Solar Turbines	Session Organizer: **Daejong Kim,** University of Texas at Arlington
11:15	GT2018:75430 **Characterizing Static and Dynamic Mechanical Properties for Additive Manufactured ULTEM 9085 Used to Construct Flow Control Devices for Turbomachinery Applications** ***Khang D. Pham, Walter Obrien, Scott W. Case,*** *Virginia Tech*	GT2018:77343 **Compressor Dynamics** ***Rainer Kurz,*** *Solar Turbines;* ***J. Jeffrey Moore, Klaus Brun,*** *Southwest Research Institute*	GT2018:75705 **Comparison of Modelling Approaches for Bump-type Foil Thrust Bearings Operating with CO2** ***Kan Qin, Daijin Li, Kai Luo, Zhansheng Tian,*** *Northwestern Polytecnical University;* ***Ingo Jahn,*** *The University of Queensland*
11:45	GT2018:76686 **ADDITIVE MANUFACTURING FOR THE MANUFACTURE OF GAS TURBINE ENGINE COMPONENTS: LITERATURE REVIEW AND FUTURE PERSPECTIVES** ***Aboma Wagari Gebisa, Hirpa G. Lemu,*** *University of Stavanger*	TUTORIAL	GT2018:75894 **Vibration control for rotor mounted on a novel active bump type foil bearing with controllable mechanical preloads** ***Guan Hanqing, Liu Tianyu, Zhang Tao, Feng Kai, Guo Zhiyang,*** *Hunan University*
12:15	GT2018:75548 **Analysis of Parameters Influencing Build Accuracy of a SLM Printed Compressor Outlet Guide Vane** ***Adetayo Otubusin, Paul Wood,*** *University of Derby;* ***John Appleby, Rafael Adamczuk,*** *FTT (UK) Ltd.*		

	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO^2 POWER CYCLES
	Fatigue Life Modelling	**Introduction to Harmonic Balance and Application to Nonlinear Vibration Analysis**	**Materials for Supercritical CO2 Power Cycles**
	Technical Session • E-8 • TB-31-03	**Tutorial Session • E-7 • TB-35-11**	**Tutorial Session • Akershus • TB-38-13**
	Session Organizer: **Dipankar Dua**, Siemens Energy Inc. Session Co-Chair(s): **Ajay Taneja,** Rolls-Royce; **Martin Hughes**, Siemens Industrial Turbomachinery Ltd	Session Organizer: **Harald Schoenenborn,** MTU Aero Engines AG Session Co-Chair(s): **Luigi Carassale**, University of Genova	Session Organizer: **Ganesan Subbaraman,** Gas Technology Institute
11:15	GT2018:76903 **A Reduced Order Constitutive Modeling Approach for a Material Subjected to Combined Cycle Fatigue** ***Ali Gordon, Thomas Bouchenot,*** *University of Central Florida*	GT2018:77353 **Introduction to Harmonic Balance and application to nonlinear vibrations** ***Malte Krack, Johann Gross,*** *University of Stuttgart*	GT2018:77462 **Tutorial on Materials for sCO2 Power Cycles** ***Ganesan Subbaraman,*** *Gas Technology Institute;* ***Henry Saari,*** *Carleton University;* ***Steven Kung,*** *Electric Power Research Institute*
11:45	GT2018:76973 **Measurement of Hysteresis Energy Using Digital Image Correlation with Application to Energy Based Fatigue Life Prediction** ***Dino Celli, Mo-How Shen,*** *The Ohio State University;* ***Casey Holycross, Onome Scott-Emuakpor, Tommy George,*** *Aerospace Systems Directorate AFRL*	TUTORIAL	TUTORIAL
12:15	GT2018:76669 **A Framework For Life Prediction of 2.25Cr-1Mo Under Creep and Thermomechanical Fatigue** ***Firat Irmak, Ali Gordon,*** *Univ Of Central Florida*		

TUESDAY, JUNE 12 — 11:15 AM - 12:45 PM

	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DEPOSITION, EROSION, FOULING, AND ICING
	Flow Control - 1	**Aerodynamic Studies I**	**Modeling Deposition in Turbine Cooling Passages**
	Technical Session • E-1 • TB-39-11	**Technical Session • E-4 • TB-41-07**	**Technical Session • E-2 • TB-47-02**
	Session Organizer: **Nick Nolcheff**, Honeywell Session Co-Chair(s): **Ho-On To**, University of Cambridge	Session Organizer: **Alexander Wiedermann**, Man Diesel & Turbo SE Session Co-Chair(s): **Milan Petrovic**, University of Belgrade	Session Organizer: **Nagaraja Rudrapatna**, Honeywell Session Co-Chair(s): **Brett Barker**, Rolls-Royce
11:15	GT2018:75520 **THE COMBINATION BETWEEN MICRO-VORTEX GENERATOR AND SUCTION ON PERFORMANCE IN A HIGH-LOAD COMPRESSOR CASCADE** ***Shan Ma, WuLi Chu, Haoguang Zhang, Chuanle Liu,*** *Northwestern polytechnical university*	GT2018:75536 **Aerodynamic and Mechanical Analyses on Manufacturing Variations of a Turbine Blade Row** ***Jong-shang Liu, Douglas Zhu, Bryon Lew, Aaron Rodriguez,*** *Honeywell*	GT2018:75310 **Effect of Pore Blockage on Transpiration Cooling with Additive Manufacturable Perforate Holes** ***Li Yang, Zheng Min, Sarwesh Parbat, Minking Chyu,*** *Univ Of Pittsburgh*
11:45	GT2018:75910 **Effect Of End-wall Vortex Generator Jet Parameters On Flow Control In a High Subsonic Compressor Cascade** ***Cong Chen, Jianyang Yu, Fu Chen,*** *Harbin Institute of Technology*	GT2018:75642 **Steady CFD Simulation of a High Pressure Turbine Rotor with Hub and Shroud Purge Flow** ***Wolfgang Sanz, Stefan Zerobin, Manfred Egger, Pascal Bader, Emil Goettlich, Franz Heitmeir,*** *Graz University of Technology;* ***Paul Pieringer****, Springer und Pieringer EDV Dienstleistungen OG*	GT2018:75833 **A Numerical Study of Dust Deposition in a Turbine Vane Cooling Passage Model** ***Way Lee Cheng, Bing Guo,*** *Texas A&M University at Qatar;* ***Ryan Lundgreen,*** *Brigham Young Univesity*
12:15	GT2018:75912 **A Combination Application of Negative Bowed Blade and Endwall Unsteady Pulsed Holed Suction In A Highly Loaded Compressor Cascade** ***Chen Shaowen, Hongxin Zhang, Qinghe Meng, Songtao Wang, Zhongqi Wang,*** *Harbin Institute of Technology*	GT2018:77281 **REDISTRIBUTION OF TOTAL TEMPERATURE THROUGH AN ANNULAR TURBINE NOZZLE CASCADE** ***Joshua Szczudlak, Arman Mirhashemi, Scott Morris,*** *University of Notre Dame; Sara Rostami,* ***Jonathon Slepski,*** *GE Global Research;* ***Greg Sluyter, Gregory Laskowski,*** *GE Aviation; Kirk Gallier, GE*	GT2018:76683 **The Use Of Fluid-Solid Cell Transformation To Model Volcanic Ash Deposition Within A Gas Turbine Hot Component** ***Jonathan Connolly, Peter Forsyth, Matthew McGilvray, David Gillespie,*** *University of Oxford*

TUESDAY, JUNE 12 — 11:15 AM - 12:45 PM

	TURBOMACHINERY: GENERAL INTEREST	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY
	A Pragmatic Approach to CFD - Best Practices for Industrial Flows and Turbomachinery	**Centrifugal Compressors: Stability**	**Condition Monitoring and Reliability**
	Tutorial Session • E-5 • TB-40-01	**Technical Session • E-3 • TB-44-03**	**Technical Session • Hordaland • TB-48-03**
	Session Organizer: **Dale Van Zante**, NASA Glenn Research Center	Session Organizer: **Daniel Rusch**, ABB Turbo Systems Ltd Session Co-Chair(s): **Friedrich Froehlig**, MTU Friedrichshafen Gmbh	Session Organizer: **Juan Jauregui**, UNIVERSIDAD AUTONOMA DE QUERETARO Session Co-Chair(s): **Joseph Saverin**, TU Berlin
11:15	GT2018-77626 **A Pragmatic Approach to CFD - Best Practices for Industrial Flows and Turbomachinery** ***Robin Steed,*** *ANSYS, Inc.* ***Thorsten Hansen****, Isimq Gmbh*	GT2018:75765 **Investigation on the stall inception circumferential position and stall process behavior in a centrifugal compressor with volute** ***Hanzhi Zhang, Ce Yang, Dengfeng Yang, Mingxu Qi, Wenli Wang, Changmao Yang,*** *Beijing Institute of Technology*	GT2018:76830 **STATISTICAL ANALYSIS OF COMPONENT FAILURES: A 16-YEAR SURVEY ON MORE THAN 550 WIND TURBINES** ***Lorenzo Ferrari,*** *University of Pisa - DESTEC;* ***Guido Soldi, Enzo Dalpane,*** *e2i Energie Speciali s.r.l.;* ***Alessandro Bianchini****, University of Florence*
11:45	**T U T O R I A L**	GT2018:76461 **EFFECT OF IMPELLER OUTLET FLOW AFFECTED BY CASING TREATMENT ON ROTATING STALL IN VANE-LESS DIFFUSER IN CENTRIFUGAL TURBOMACHINERY** *Kazuhiro Tsukamoto, Hitachi, Ltd., Research & Development Group; Shohei Suto, Kiyotaka Hiradate, Yasushi Shinkawa, Industrial Products Business Units, Hitachi, Ltd.*	GT2018:76993 **Vibration based condition monitoring of wind turbine gearboxes based on cyclostationary analysis** ***Konstantinos Gryllia****s,* ***Alexandre Mauricio, Junyu Qi,*** *KU Leuven Faculty of Engineering*
12:15		GT2018:76916 **Rotating Instabilities Versus Rotating Stall In A High-Speed Centrifugal Compressor** ***Julissa Grondin, Nicolas Rochuon,*** *Safran Tech;* ***Isabelle Trebinjac****, Ecole Centrale de Lyon*	GT2018:76485 **Simulating Wind Turbine Ice Throw: QBlade and statistical analysis** ***Matthew Lennie, David Marten,*** *TU Berlin;* ***Sean Dominin****, ETH Zurich;* ***George Pechlivanoglou, Christian Oliver Paschereit****, H.F.I TU Berlin*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	AIRCRAFT ENGINE	COAL, BIOMASS & ALTERNATIVE FUELS	COMBUSTION, FUELS & EMISSIONS
	Future Advanced Aircraft and Recent Developments in Propulsion Integration	**Alternative Fuel Chemistry and Fundamentals**	**Microturbine Combustors**
	Panel Session • Jan Mayen 2 • TC-1-18 Part A	**Technical Session • Akershus • TC-3-01 Part A**	**Technical Session • A1-2 • TC-4-09 Part A**
	Session Organizer: **William Cousins**, United Technologies Research Center Session Co-Chair(s): **Mark Celestina,** NASA Glenn Research Center	Session Organizer: **Subith Vasu**, University of Central Florida Session Co-Chair(s): **Jeffrey Bergthorson**, McGill University	Session Organizer: **Antonio Ficarella,** University of Salento Session Co-Chair(s): **Bernd Prade**, Siemens AG KWU
2:00	GT2018:77584 **Challenges of Future Propulsion Integration** ***Vincent Billerot**, AIRBUS Operations S.A.S.* GT2018:77585 **System-level Benefits Assessment of Boundary Layer Ingesting Propulsion** ***Stuart Ochs**, United Technologies Research Center* GT2018:77586 **Boundary Layer Ingesting Propulsion: First Experimental Test Results and Prospective Future Aircraft Applications** ***David J. Arend**, NASA Glenn Research Center at Lewis Field*	GT2018:75136 **Emission of carbonyl and polyaromatic hydrocarbon pollutants from the combustion of liquid fuels: Impact of biofuel blending.** ***Philippe Dagaut**, Yuri Bedjanian, Guillaume Dayma, Benoet Grosselin, Manolis Romanias, Roya Shahla, CNRS; **Fabrice Foucher**, University of Orleans*	GT2018:77208 **Investigation of the Down-scaling Effects on the Low Swirl Burner and its Application to Microturbines** ***Alex Frank, Peter Therkelsen, Miguel Sierra Aznar, Jyh-Yuan Chen, Vi H. Rapp, Robert K. Cheng,** University of California, Berkeley/ Lawrence Berkeley National Laboratory*
2:30	**P A N E L**	GT2018:76997 **Reaction Model Development for Synthetic Jet Fuels - Surrogate Fuels as a Flexible Tool to Predict their Performance** ***Marina Braun-Unkhoff, Trupti Kathrotia, Sandra Richter, Clemens Naumann, Nadja Slavinskaya, Torsten Methling, Uwe Riedel,** German Aerospace Center (DLR*	GT2018:75050 **Experimental and Numerical Design Study for a Small Scale Jet-Stabilized Micro Gas Turbine Combustor** ***Stefan Hasemann, Hannah Seliger, Peter Kutne, Manfred Aigne**r, German Aerospace Centre*
3:00		GT2018:77238 **Experimental and Numerical Investigation of the Early Phase of Laser Ignition under Stoichiometric and Lean conditions** ***Deshawn Coombs, Nathan Peters, Benjamin Akih Kumgeh,** Syracuse University*	GT2018:75940 **Experimental and Numerical Study on Emission Characteristics of the Double Annular Swirler under Different Pilot Fuel Ratio** ***Chao Zong, Yaya Lyu, Tong Zhu, Tongji University; Desan Guo, Chengqin Li, S**hanghai Fanzhi Energy Equipment Co. Ltd*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Combustion Dynamics: Modeling	**Combustion Dynamics: Damping & Control I**	**Pollutant Emissions Formation & Control I**
	Technical Session • Jan Mayen 3 • TC-4-17	**Technical Session • A1-1 • TC-4-18 Part A**	**Technical Session • Svalbard • TC-4-29 Part A**
	Session Organizer: **Bruno Schuermans**, GE (Switzerland) GmbH Session Co-Chair(s): **Fei Han**, GE Global Research Center	Session Organizer: **Wajid Chishty**, NRC Aerospace	Session Organizer: **Scott Drennan**, Convergent Science, Inc.
2:00	GT2018:75476 **Quantification of the impact of uncertainties in operating conditions on the flame transfer function with non-intrusive polynomial chaos expansion** ***Alexander Avdonin, Wolfgang Polifke,*** *Technical University of Munich*	GT2018:75423 **Comparison of Center Nozzle Staging to Outer Nozzle Staging in a Multi-Flame Combustor** ***Wyatt Culler, Xiaoling Chen, Stephen Peluso, Domenic Santavicca, Jacqueline O'Connor,*** *Pennsylvania State University;* ***David Noble****, Electric Power Research Institute*	GT2018:75254 **LES of a pressurized, sooting aero-engine model combustor at different equivalence ratios with a sectional approach for PAHs and soot** ***Martin Grader, Christian Eberle,*** *Institute of Combustion Technology, German Aerospace Center (DLR);* ***Peter Gerlinger, Manfred Aigner,*** *German Aerospace Centre*
2:30	GT2018:75692 **Adjoint Methods for Elimination of Thermoacoustic Oscillations in a Model Annular Combustor via Small Geometry Modifications** ***Jose G. Aguilar, Matthew Juniper,*** *University of Cambridge*	GT2018:75070 **Experimental study of damper position on instabilities in an annular combustor** ***Marek Mazur, Hakon T. Nygard, James Dawson, Nicholas Worth,*** *NTNU, Department of Energy and Process Engineering (EPT)*	GT2018:75366 **Soot Prediction in an Aircraft Combustor at Realistic Operation Conditions** ***Alexander Steinbach, Tobias Dittmann, German Aerospace Center,*** *Institute of Combustion Technology;* ***Ruud Eggels,*** *Rolls-Royce Deutschland Ltd & Co KG;* ***Peter Gerlinger, Manfred Aigner,*** *German Aerospace Centre*
3:00	GT2018:76368 **INFLUENCE OF OF NON-AXISYMMETRIC CONFINEMENT ON THE HYDRODYNAMIC STABILITY OF MULTI-NOZZLE SWIRL FLOWS** ***Harish Subramanian, Kiran Manoharan, Santosh Hemchandra,*** *Department of Aerospace Engineering, Indian Institute of Science*	GT2018:75408 **Guiding actuator designs for active flow control of the precessing vortex core by adjoint linear stability analysis** ***Jens S. Muller, Finn Luckoff, Kilian Oberleithner****, TU Berlin*	GT2018:76205 **A New Experimental Database for the Investigation of Soot in a Model Scale Swirled Combustor under Perfectly Premixed Rich Conditions** ***Mathieu Roussillo,*** *Air Liquide/EM2C/CentraleSupelec;* ***Philippe Scouflaire, Nasser Darabiha,*** *EM2C-CNRS/CentraleSupelec;* ***Sebastien Candel, Benedetta Franzelli,*** *Laboratoire EM2C, CentraleSupelec, CNRS*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	CYCLE INNOVATIONS	ELECTRIC POWER	FANS & BLOWERS
	Turbomachinery Design Aspects in Cycle Innovation	**Path Forward: Gas Turbine Technology**	**Fans and Blowers: Noise Analysis and Experiments**
	Technical Session • Oslo • TC-6-06	**Panel Session • Nord-Norge • TC-8-04 Part A**	**Technical Session • Romerike • TC-9-04**
	Session Organizer: **Ioanna Aslanidou**, Malardalen University Session Co-Chair(s): **Jonathan Sands**, Rolls-Royce Corporation; **Frederic Goenaga**, Rolls-Royce; **Xin Zhao**, Malardalen University	Session Organizer: **Richard Dennis**, US Dept Of Energy Session Co-Chair(s): **Sy Ali**, Clean Energy Consulting	Session Organizer: **Alessandro Corsini**, Sapienza University Of Rome Session Co-Chair(s): **Alessio Castorrini**, Sapienza University of Rome
2:00	GT2018:75967 **A NUMERICAL STUDY ON REDUCING THE BLADE SURFACE TEMPERATURE IN THE ULTRA-HIGH EFFICIENCY GAS TURBINE ENGINE BY INDEXING FUEL INJECTORS AND USING FILM COOLING** ***Seyed Ghoreyshi, Meinhard Schobeiri,*** *Texas A & M University*	GT2018:77488 **MHPS Path Forward: Gas Turbine Technology** ***Eisaku Ito****, MHI Takasago R&D Center* GT2018:77490 **GE Path Forward: Gas Turbine Technology** ***Joseph Citeno****, GE Power* GT2018:77489 **Ansaldo Energia Path Forward: Gas Turbine Technology** ***Stefan Florjancic****, Ansaldo Energia Switzerland*	GT2018:75243 **Numerical prediction of tonal noise in centrifugal blowers** ***Carlo Cravero****, Università Degli Studi Di Genova;* ***Davide Marsano****, DIME - University of Genoa*
2:30	GT2018:76504 **COMPRESSOR INSTABILITY ANALYSIS WITHIN AN HYBRID SYSTEM SUBJECT TO CYCLE UNCERTAINTIES** ***Alessandra Cuneo, Alberto Traverso, Aristide F. Massardo,*** *Univ Of Genoa*	**P A N E L**	GT2018:76079 **Aerodynamic Characteristics and Noise Analysis of A Low-speed Axial Fan** ***Bo Luo, WuLi Chu, Wei Dong, Xiangyi Chen,*** *Northwestern Polytechnical University*
3:00	GT2018:76529 **The Heron Fan - Concept Description and Preliminary Aerothermodynamic Analysis** ***Finn Schoning, Dragan Kozulovic,*** *Hamburg University of Applied Science*		GT2018:76300 **Tonal noise control of cooling fan module by using modulation principles on both rotor and stator** ***Zhigang Peng, HUA OUYANG, Yadong Wu, Jie Tian,*** *Shanghai Jiao Tong University*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	HEAT TRANSFER: COMBUSTORS (WITH COMBUSTION, FUELS & EMISSIONS)	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: GENERAL COMPUTATIONAL HEAT TRANSFER
	Combustor Liner Heat Transfer	**Endwall Film Cooling**	**General Computational Heat Transfer I**
	Technical Session • Jan Mayen 1 • TC-17-01 Part A	**Technical Session • A1-6 • TC-19-02 Part A**	**Technical Session • A1-3 • TC-22-01 Part A**
	Session Organizer: **Marc D. Polanka**, AFIT/ENY Session Co-Chair(s): **Rudy Dudebout**, Honeywell Aerospace	Session Organizer: **Kapil Panchal**, Elliott Group Session Co-Chair(s): **Srinath Ekkad**, North Carolina State University	Session Organizer: **Harika S. Kahveci**, Middle East Technical University (METU) Session Co-Chair(s): **John Clark**, AFRL/RQTT
2:00	GT2018:76335 **A Review of Impingement Jet Cooling in Combustor Liner** ***Rong Xie, Hao Wang, Baopeng Xu, Wei Wang,*** *Dalian University of Technology*	GT2018:75038 **AERODYNAMIC AND HEAT TRANSFER EXPERIMENTAL INVESTIGATION OF PLATFORM COOLING ON A HP NOZZLE VANE CASCADE** ***Giovanna Barigozzi, Silvia Mosconi, Antonio Perdichizzi,*** *University of Bergamo;* ***Luca Abba, Stefano Vagnoli,*** *Ansaldo Energia*	GT2018:75099 **Aerothermal Optimization of Fully Cooled Turbine Blade Tips** ***Valeria Andreoli, James Braun, Guillermo Paniagua,*** *Purdue University;* ***Cis De Maesschalck, Matthew J. Bloxham, William G. Cummings, Lawrence E. Langford,*** *Rolls-Royce plc*
2:30	GT2018:75608 **Numerical Investigation Film Cooling Slots of Gas Turbine Combustor Liner** ***Firat Kiyici, Ahmet Topal, Ender Hepkaya, SINAN INANLI,*** *TUSAS Engine Industries Inc.*	GT2018:75272 **Turbine Vane Endwall Film Cooling Comparison from Five Film-Hole Design Patterns and Three Upstream Leakage Injection Angles** ***Chao-Cheng Shiau, Izzet Sahin, Nian Wang, Je-Chin Han,*** *Texas A&M University;* ***Hongzhou Xu, Michael Fox,*** *Solar Turbines*	GT2018:75703 **EFFECT OF TEMPERATURE RATIO ON JET IMPINGEMENT HEAT TRANSFER IN ACTIVE CLEARANCE CONTROL SYSTEMS** ***Riccardo Da Soghe, Cosimo Bianchini, Jacopo D'Errico, Lorenzo Tarchi,*** *Ergon Research*
3:00	GT2018:76779 **Numerical and experimental investigation on an effusion-cooled lean burn aeronautical combustor: aerothermal field and metal temperature** ***Davide Bertini, Lorenzo Mazzei, Stefano Puggelli, Antonio Andreini, Bruno Facchini,*** *University of Florence;* ***Lorenzo Bellocci, Antonio Santoriello,*** *GE Avio s.r.l*	GT2018:75877 **Effect of Coolant Injection Angle on Nozzle Endwall Film Cooling: Experimental and Numerical Analysis in Linear Cascade** ***Lamyaa El-Gabry,*** *Princeton University;* ***Hongzhou Xu, Kevin Liu, James Chang, Michael Fox,*** *Solar Turbines Incorporated*	GT2018:75906 **CFD INVESTIGATION OF THE FLOW OF TRAILING EDGE COOLING SLOTS** ***Yuewen Jiang, Niharika Gurram, Peter Ireland, Luca Di Mare,*** *University of Oxford;* ***Ed Romero,*** *Rolls Royce*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	HEAT TRANSFER: GENERAL EXPERIMENTAL HEAT TRANSFER	MARINE	OIL & GAS APPLICATIONS
	Thermal Systems Design and Research	**Auxillaries and Support Systems**	**Two- and Multi-Phase Applications**
	Technical Session • A1-4 + A1-5 • TC-13-01 Part A	**Technical Session • Event Room • TC-25-03**	**Technical Session • Sør-Norge• TC-27-03**
	Session Organizer: **Mike Barringer**, Pennsylvania State University Session Co-Chair(s): **James Downs**, Florida Turbine Technologies Inc	Session Organizer: **Morgan Hendry**, SSS Clutch Company, Inc. Session Co-Chair(s): **Ningbo Zhao**, Harbin Engineering University	Session Organizer: **Jason Wilkes**, Southwest Research Institute
2:00	GT2018:75176 **REDUCTION OF HEAT TRANSFER ON THE ENDWALL IN THE UPSTREAM JUNCTION REGION OF A SYMMETRIC AIRFOIL WITH VORTEX GENERATOR PAIR** ***Bengt Sunden, Safeer Hussain, Jian Liu, Lei Wang**, Lund University, Energy Sciences*	GT2018:75987 **Numerical investigation of dynamic responses of ship structure and gas turbine subjected to underwater explosion** ***N. Wang, Y.L. Liu, B.X. Liu, A.M. Zhang**, Harbin Engineering University*	GT2018:75211 **Flow Analysis of an Operational Natural Gas Turbo Expander** ***Changjiang Huo, Xi'an** Jiaotong University; **Jinju Sun**, Xi'an Jiaotong University; **Shan Sun, Peng Song**, Xi'an Jiaotong University; **Guizheng Zhao, Ben Pan**, Shanghai Petroleum Co., Limited*
2:30	GT2018:75177 **Effects of the Location of a Pocket Cavity on Heat Transfer and Flow Characteristics of the Endwall with a Symmetrical Vane** ***Bengt Sunden, Jian Liu, Safeer Hussain, Lei Wang, L**und University, Energy Sciences; **Gongnan Xie**, Northwestern Polytechnical University*	GT2018:76043 **A novel method of inlet and exhausts system simulators for real marine engine under lab conditions** ***Yigang Luan, Lianfeng Yang, Yonglei Qu**, Harbin Engineering University*	GT2018:75380 **Experimental Study of Two-Phase Air/Water Flows in a Centrifugal Pump Running with a Closed or a Semi-Open Impeller** ***Michael Mansour, Bernd Wunderlich, Dominique Thevenin**, Otto-von-Guericke Magdeburg university*
3:00	GT2018:75332 **Influence of Scaling Parameters and Gas Properties on Overall Effectiveness on a Leading Edge Showerhead** ***Connor Wiese**, Air Force Research Laboratory; **Carol Bryant**, United States Air Force; **James L. Rutledge**, Air Force Institute of Technology; **Marc D. Polanka**, AFIT/ENY*	GT2018:76945 **Development and Testing of a Gas Turbine Engine Combustion Air Inlet Protection Shroud for the USMC Amphibious Combat Vehicle** ***Thomai Gastopoulos**, Naval Surface Warfare Center Philadelphia Division; **Patricia E. McGinn**, Gibbs & Cox, Inc; **Joseph Lawton**, NSWCPD*	GT2018:76429 **THERMODYNAMIC MODELLING ASPECTS OF WET COMPRESSION IN RADIAL COMPRESSORS** ***Sebastian Schuster, Dieter Brillert, Viktor Hermes**, University of Cambridge; **Attilla Yildiz**, Siemens AG; **Friedrich-karl Benra**, Univ of Duisburg-essen*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Aeroelastic Design and Flutter Mitigation Mechanisms	**Probabilistic Methods Fundamentals 1**	**Dynamics of Bladed Disks with Nonlinearities**
	Technical Session • E-8 • TC-36-01 Part A	**Tutorial Session • E-6 • TC-32-04**	**Technical Session • E-7 • TC-35-07 Part A**
	Session Organizer: **Yoon Choi**, GE Aviation Session Co-Chair(s): **Toshinori Watanabe**, The University of Tokyo	Session Organizer: **Michael Enright**, Southwest Research Inst	Session Organizer: **Fabrice Thouverez**, Laboratory of Tribology and Systems Dynamics Session Co-Chair(s): **Stefano Zucca**, Politecnico Di Torino - DIMEAS
2:00	GT2018:75079 **Aeroelastic control on compressor blades with virtual control surfaces: a numerical assessment** ***Valentina Motta, Leonie Malzacher, Dieter Peitsch,*** *Technische Universitat Berlin;* ***Victor Bicalho Civinelli de Almeida,*** *TU Berlin, Chair of Aero engines*	GT2018:77445 **Introduction to Probabilistic Analysis and Uncertainty Quantification** ***Mark Andrews, Peter Chien,*** *SmartUQ*	GT2018:75186 **Rig and Engine Validation of the Non-linear Forced Response Analysis Performed by the Tool OrAgL** ***Dr. Andreas Hartung, Hans-Peter Hackenberg,*** *MTU Aero Engines AG;* ***Malte Krack, Johann Gross,*** *University of Stuttgart;* ***Torsten Heinze, Lars Panning-von Scheidt,*** *Leibniz Universitat Hannover*
2:30	GT2018:75080 **A physically consistent reduced order model for plasma aeroelastic control on compressor blades** ***Valentina Motta, Leonie Malzacher, Dieter Peitsch,*** *Technische Universitat Berlin;* ***Giuseppe Quaranta,*** *Politecnico di Milano*	**T U T O R I A L**	GT2018:75188 **A Study of Dynamic Phenomena Caused by Impulse Mistuning in Case of Self-excitation** ***Peter Mueller,*** *Euro Engineering AG;* ***Dr. Andreas Hartung, Hans-Peter Hackenberg,*** *MTU Aero Engines AG*
3:00	GT2018:75081 **Intentional mistuning with predominant aerodynamic effects** ***Carlos Martel, Jose J Sanchez,*** *Universidad Politecnica de Madrid*		GT2018:75290 **Rotational Speed-Dependent Contact Formulation For Nonlinear Blade Dynamics Prediction** ***Torsten Heinze, Joerg Wallaschek,*** *Leibniz Universitat Hannover;* ***Dr. Andreas Hartung,*** *MTU Aero Engines AG*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DEPOSITION, EROSION, FOULING, AND ICING
	Turbulence & Transition	**Low Pressure Turbine Aerodynamics II**	**Deposition Modeling - II**
	Technical Session • E-4 • TC-39-02 Part A	**Technical Session • E-2 • TC-41-04 Part A**	**Technical Session • E-5 • TC-47-05 Part A**
	Session Organizer: **Alexander Hergt**, German Aerospace Center DLR Session Co-Chair(s): **Sam Grimshaw**, University of Cambridge Whittle Laboratory	Session Organizer: **Domenico Borello**, Sapienza University of Rome	Session Organizer: **Paolo Venturini,** Sapienza University of Rome Session Co-Chair(s): **Jeffrey P. Bons,** Ohio State University
2:00	GT2018:76507 **An Experimental Setup for Idealised Studies on Transition to Turbulence on a Generic Compressor Outlet Guide Vane** ***Jens H. M. Fransson, Santhosh B. Mamidala, Bengt E. G. Fallenius,*** *KTH - Royal Institute of Technology;* ***Hans Mørtensson****, GKN Aerospace;* ***Fredrik Wallin****, GKN Aerospace Sweden AB*	GT2018:75796 **Large Eddy Simulations of a Low-Pressure Turbine - Roughness Modelling and the Effects on Boundary Layer Transition and Losses** ***Florian Hammer, Neil D. Sandham,*** *University of Southampton;* ***Richard Sandberg****, The University of Melbourne*	GT2018:75997 **Numerical Investigation of Particles Deposition on Leading Edge of Nozzle Guide Vane** ***Xiaojun Yang, Zishuo Li, Mohan Cui****, Civil Aviation University of China*
2:30	GT2018:76708 **Skin Friction Measurements of Transition in High Reynolds Number, Adverse Pressure Gradient Flow** ***Brian Holley, Larry Hardin, Gregory Tillman, Ray-Sing Lin, Jongwook Joo,*** *United Technologies Research Center*	GT2018:75976 **Using Turbulence Intensity and Reynolds Number to Predict Flow Separation on a Highly Loaded, Low-Pressure Gas Turbine Blade at Low Reynolds Numbers** ***Kenneth Van Treuren, Tyler Pharris, Olivia Hirst,*** *Baylor University*	GT2018:77158 **An Improved Particle Impact Model by Accounting for Rate of Strain and Stochastic Rebound** ***Steven Whitaker****, Honeywell Aerospace;* ***Jeffrey Bons****, Ohio State University*
3:00	GT2018:76573 **A 3D-LDA Study of the Relation between Coincident and Time Stepped Non-Coincident Stress Measurements in a Linear Compressor Cascade** ***Silvio Geist, Janneck Harbeck, Franz Joos,*** *Helmut Schmidt University*	GT2018:76233 **LES and RANS analysis of the end-wall flow in a linear LPT cascade with variable inlet conditions, Part I: Flow and secondary vorticity fields.** ***Richard Pichler, Yaomin Zhao, Richard Sandberg,*** *The University of Melbourne;* ***Vittorio Michelassi,*** *Baker Hughes a GE company;* ***Roberto Pacciani, Michele Marconcini, Andrea Arnone,*** *University Of Florence*	GT2018:76776 **On Deposition and Build-up Detachment in Compressor Fouling** ***Nicola Casari, Michele Pinelli, Alessio Suman,*** *University of Ferrara*

TUESDAY, JUNE 12 — 2:00 - 3:30 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY	MANUFACTURING MATERIALS & METALLURGY
	LES and DNS Methods and Applications	**Centrifugal Compressors: Performance & Flow Control**	**Structural Loads, Aeroelasticity and Noise**	**Additive Manufacturing for Aircraft Gas**
	Technical Session • E-3 • TC-42-01 Part A	**Technical Session • E-1 • TC-44-08 Part A**	**Panel Session • Hordaland • TC-48--02 Part A**	**Panel Session • Hall B4 • TC-24-17**
	Session Organizer: **Chunill Hah**, NASA Glenn Session Co-Chair(s): **Rob Watson**, University of Cambridge	Session Organizer: **Luca Porreca**, MAN Diesel&Turbo Schweiz AG Session Co-Chair(s): **Hamid Hazby**, PCA Engineers Limited	Session Organizer: **George Pechlivanoglou**, HFI Session Co-Chair(s): **Juan Jauregui**, UNIVERSIDAD AUTONOMA DE QUERETARO; **Alexandrina Untaroiu,** Virginia Tech	Session Organizer: **Henry Bernstein**, Gas Turbine Materials Assoc
2:00	GT2018:75773 **Assessment of wall modeling for Large Eddy Simulations of turbomachinery** ***Jagadeesh Movva, Dimitrios Papadogiannis,*** *Safran Tech;* ***Stephane Hiernaux****, Safran Aero Boosters*	GT2018:75494 **The impact of inlet distortion and reduced frequency on the performance of centrifugal compressors** ***Angelo Grimaldi, Vittorio Michelassi,*** *Baker Hughes GE*	GT2018:75889 **Impact of Blade Flexibility on Wind Turbine Loads and Pitch Settings** ***Jinge Chen, Xin Shen, Xiaocheng Zhu, Zhaohui Du****, Shanghai Jiao Tong University*	GT2018:77617 **Status of Additive Manufacturing at Pratt and Whitney** ***Michael Winter,*** *Pratt and Whitney* GT2018:77618 **Regulatory Aspects of AM from FAA Perspective** ***Michael Gorelik,*** *FAA*
2:30	GT2018:75711 **Importance of boundary layer transition in a high-pressure turbine cascade using LES** ***Luis Segui, Laurent Y.M. Gicquel, Florent Duchaine****, CERFACS;* ***Jerome de Laborderie****, Safran Aircraft Engine*	GT2018:76267 **Measurement of unsteady pressure field in a turbocharger compressor using pressure-sensitive paint** ***Takaaki Kitamura, Wataru Watanabe, Kazutaka Horimoto, Masaharu Kameda,*** *Tokyo Univ Of Agriculture and Technology;* ***Kenta Akimoto, Akihito Akahori,*** *Toyota Industries Corporation*	GT2018:76977 **Cross-Talk Compensation for Blade Root Flapand Edgewise Moments on an Experimental Research Wind Turbine and to Comparison Numerical Results** ***Sirko Bartholomay,*** *TU Berlin;* ***Mariano Sanchez Martinez****, KTH Stockholm;* ***David Marten****, TU Berlin – ISTA;* ***Annette Claudia Klein, Thorsten Lutz, Ewald Kramer****, University of Stuttgart;* ***Joerg Alber****, Technische Universitaet Berlin;* ***Christian Navid Nayeri, George Pechlivanoglou, Christian Oliver Paschereit****, H.F.I TU Berlin*	**P** **A** **N** **E** **L**
3:00	GT2018:75741 **Evaluation of integral turbulence scales through the fan stage of a turbofan using hot wire anemometry and Large Eddy Simulation** ***Nicolas Odier, Florent Duchaine, Laurent Y.M. Gicquel, Gabriel Staffelbach,*** *CERFACS;* ***Adrien Thacker, Nicolas Garcia Rosa,*** *ISAE-SUPAERO;* ***Guillaume Dufour****, ISAE;* ***Jens-Dominik Mueller****, Queen Mary University of London*	GT2018:76851 **UNSTEADY RESPONSES OF THE IMPELLER OF A CENTRIFUGAL COMPRESSOR EXPOSED TO PULSATING BACKPRESSURE** ***Mengying Shu, Mingyang Yang, Kangyao Deng, Lei Shi,*** *Shanghai Jiao Tong University;* ***Ricardo Martinez-Botas,*** *Imperial College London*	GT2018-76078 **Investigations on the Fatigue Load ReductionPotential of Advanced Control Strategies for Multi-MW Wind Turbines using a Free Vortex Wake Model** ***Sebastian Perez-Becker, Joseph Saverin,*** *TU Berlin;* ***David Marten****, TU Berlin – ISTA;* ***Joerg Alber****, Technische Universitaet Berlin;* ***George Pechlivanoglou, Christian Oliver Paschereit****, H.F.I TU Berlin*	

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	AIRCRAFT ENGINE	COAL, BIOMASS & ALTERNATIVE FUELS	COMBUSTION, FUELS & EMISSIONS
	Turbulence & Transitiona Future Advanced Aircraft and Recent Developments in Propulsion Integration	**Alternative Fuel Chemistry and Fundamentals**	**Microturbine Combustors**
	Panel Session • Jan Mayen 2 • TD-1-18 Part B	**Technical Session • Akershus • TD-3-01 Part B**	**Technical Session • A1-2 • TD-4-09 Part B**
	Session Organizer: **William Cousins**, United Technologies Research Center Sesssion Co-Chair(s): **Mark Celestina**, NASA Glenn Research Center	Session Organizer: **Benjamin Akih Kumgeh,** Syracuse University Session Co-Chair(s): **Marina Braun-Unkhoff,** DLR	Session Organizer: **Antonio Ficarella,** University of Salento Session Co-Chair(s): **Bernd Prade**, Siemens AG KWU
4:00	GT2018:77591 **The Critical Role of PAI in Alternate Subsonic Transport Configurations with Potential to Achieve NASÂs Midterm Goals** ***Anthony Washburn,*** *NASA Langley Research Center* GT2018:77590 **Aircraft Propulsion System Integration - The Journey Ahead** ***Dilip Prasad****, Pratt & Whitney*	GT2018:75945 **Simulation of the Primary Jet Breakup of Non-Newtonian Fuels: Basic Research for Simulation-Assisted Design of Low-Grade Fuel Burner** ***Thomas Muller, Kathrin Kadel, Peter Habisreuther, Dimosthenis Trimis,*** *Karlsruhe Institute of Technology, Engler-Bunter-Institute;* ***Alexander Sanger, Thomas Kolb, Tobias Jakobs,*** *Karlsruhe Institute of Technology, Institute of Technical Chemistry;* ***Nikolaos Zarzalis,*** *Division of Combustion Technology, Karlsruhe Institute of Technology (KIT)*	GT2018:75481 **Optical measurements of a lcv-combustor operated in a micro gas turbine with various fuel compositions** ***Timo Zornek, Thomas Mosbach, Manfred Aigner,*** *German Aerospace Center (DLR)*
4:30	**P A N E L**	GT2018:75950 **Influence of Reactor Pressure on the Primary Jet Breakup of High-viscosity Fuels: Basic Research for Simulation-Assisted Design of Low-Grade Fuel Burner** ***Thomas Muller, Kathrin Kadel, Peter Habisreuther, Dimosthenis Trimis,*** *Karlsruhe Institute of Technology, Engler-Bunter-Institute;* ***Alexander Sanger, Tobias Jakobs, Thomas Kolb,*** *Karlsruhe Institute of Technology, Institute of Technical Chemistry;* ***Nikolaos Zarzalis,*** *Division of Combustion Technology, Karlsruhe Institute of Technology (KIT)*	GT2018:75065 **Evaluation of Solid-State Electrochemical Sensors for Real Time Monitoring of NO and O2 in the Exhaust of a Commerical 60kW Gas Turbine** ***Ryan Ehlig, Motonobu Takahashi,*** *UCI Combustion Laboratory;* ***Vincent McDonell,*** *University Of California*
5:00		GT2018:76209 **Thermal Stability Analysis of Gevo Jet Fuel Using Ellipsometry** ***Leigh Nash,*** *Mitsubishi Hitachi Power Systems;* ***Jennifer Klettlinger****, NASA;* ***Subith Vasu****, University of Central Florida*	

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Combustion Dynamics: Damping & Control I	**Combustion Modeling I**	**Pollutant Emissions Formation & Control I**
	Technical Session • A1-1 • TD-4-18 Part B	**Technical Session • Jan Mayen 3 • TD-4-24**	**Technical Session • Svalbard • TD-4-29 Part B**
	Session Organizer: **Wajid Chishty**, NRC Aerospace	Session Organizer: **Khawar Syed**, General Electric Session Co-Chair(s): **A. Benim,** Duesseldorf University of Applied Sciences	Session Organizer: **Scott Drennan**, Convergent Science, Inc.
4:00	GT2018:76318 **Effect of Combined Liners on Controlling Thermoacoustic Instability in a Rijke Tube** ***Guangyu Zhang, Xiaoyu Wang, Dakun Sun,*** *Beihang University;* ***Xiaofeng Sun****, Beijing University of Aeronautics and Astronautics*	GT2018:77169 **A Scale Separation Method for Pollutant Prediction in Turbulent Flames Using Transported Scalars with Flamelet Generated Manifold (FGM) Method** ***Rakesh Yadav, Shaoping Li, Ellen Meeks,*** *ANSYS, Inc.*	GT2018:76217 **The Role of Recirculation Zones in Soot Formation in Aircraft Combustors** ***Shao Teng Chong, Venkat Raman,*** *University of Michigan;* ***Michael Mueller****, Princeton University;* ***Hong Im****, King Abdullah University of Science and Technology*
4:30	GT2018:77102 **Damping of combustion instabilities through pseudo-active control** ***Jesus Oliva, Ennio Luciano, Javier Ballester,*** *University of Zaragoza / LIFTEC*	GT2018:76811 **A New Model Approach for Convective Wall Heat Losses in DQMOM-IEM Simulations for Turbulent Reactive Flows** ***Yeshaswini Emmi, Andreas Fiolitakis, Manfred Aigner,*** *German Aerospace Center (DLR);* ***Franklin Genin, Khawar Syed****, General Electric*	GT2018:76393 **Measurement and abatement of PM emitted by stationary gas turbines: Experience gained with different fuels and combustor types** ***Matthieu Vierling,*** *GE Energy Products France SNC;* ***Maher Aboujaib, Dmitry Sokolov, Pierre Montagne, Sven Catrin, Dimitris Karpouzas, Panagiotis Vamvarapis,*** *GE;* ***Michel Moliere****, UTBM;* ***Aristotelis Komodromos, George Moniatis, Frixos Kontopoulos, George Zaimis,*** *Electricity Authority of Cyprus*
5:00		GT2018:75896 **RANS and LES Modeling of a Linear-Array Swirl Burner Using a Flamelet-Progress Variable Approach** ***Sandeep Jella, Gilles Bourque,*** *Siemens Canada;* ***Jeffrey Bergthorson,*** *McGill University;* ***Wing Yin Kwong,*** *University of Toronto;* ***Adam Steinberg****, University of Toronto, Institute of Aerospace Studies*	GT2018:76705 **Numerical investigation of flame structure and soot formation in a lab-scale Rich-Quench-Lean burner** ***Andrea Giusti, Savvas Gkantonas, Jenna M. Foale, Epaminondas Mastorakos****, University of Cambridge*

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	CYCLE INNOVATIONS	ELECTRIC POWER	FANS & BLOWERS
	Pressure Gain Combustion Innovations	**Path Forward: Gas Turbine Technology**	**Fans and Blowers: System Component Design and Analysis**
	Technical Session • Oslo • TD-6-04	**Panel Session • Nord-Norge • TD-8-04 Part B**	**Technical Session • Romerike • TD-9-05**
	Session Organizer: **Guillermo Paniagua,** Purdue University Session Co-Chair(s): **Ioanna Aslanidou,** Malardalen University	Session Organizer: **Richard Dennis,** US Dept Of Energy Session Co-Chair(s): **Sy Ali**, Clean Energy Consulting	Session Organizer: **Johan Van der Spuy,** Stellenbosch University Session Co-Chair(s): **Giovanni Delibra,** Sapienza University of Rome
4:00	GT2018:75534 **T63 Turbine Response to a Rotating Detonation Combustor Exhaust Flow** ***Andrew Naples, John Hoke,*** *ISSI;* ***Ryan Battelle,*** *AFRL;* ***Fred Schauer,*** *Department of the Air Force*	GT2018:77517 **Siemens - The Path Forward for Gas Turbine Technology** ***Bengt Gudmundsson,*** *Siemens*	GT2018:75469 **Effects of Inlet Disturbances on Fan Stability** ***Kuen-Bae Lee, Mehdi Vahdati,*** *Imperial College London;* ***Mark Wilson,*** *Rolls-Royce*
4:30	GT2018:76435 **On the influence of fuel stratification and its control on the efficiency of the shockless explosion combustion cycle** ***T.S. Raehse, Florian Arnold, Jan-Simon Schapel, Rudibert King, Panagiotis Stathopoulos,*** *Technische Universitaet Berlin*	**P A N E L**	GT2018:76518 **Effects of fan inflow distortions on heat exchange in air-cooled condensers. Unsteady computations with synthetic blade model.** ***Gino Angelini, Tommaso Bonanni, Lorenzo Tieghi,*** *Dept. of Mechanical and Aerospace Engineering, Sapienza University of Rome;* ***Alessandro Corsini, Giovanni Delibra, David Volponi,*** *Sapienza University of Rome*
5:00	GT2018:76798 **Characterization of a Supersonic Turbine Downstream of a Rotating Detonation Combustor** ***Zhe Liu, James Braun, Guillermo Paniagua,*** *Purdue University*		GT2018:76659 **Numerical and experimental investigation on centrifugal cooling fan in a traction motor** ***Qu Xiaoyun, Jie Tian, Tong Wang,*** *Shanghai Jiao Tong University*

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	HEAT TRANSFER: COMBUSTORS (WITH COMBUSTION, FUELS & EMISSIONS)	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: GENERAL COMPUTATIONAL HEAT TRANSFER
	Combustor Liner Heat Transfer	**Endwall Film Cooling**	**General Computational Heat Transfer I**
	Technical Session • Jan Mayen 1 • TD-17-01 Part B	**Technical Session • A1-6 • TD-19-02 Part B**	**Technical Session • A1-3 • TD-22-01 Part B**
	Session Organizer: **Marc D. Polanka,** AFIT/ENY Session Co-Chair(s): **Rudy Dudebout**, Honeywell Aerospace	Session Organizer: **Kapil Panchal**, Elliott Group Session Co-Chair(s): **Srinath Ekkad**, North Carolina State University	Session Organizer: **Harika S. Kahveci,** Middle East Technical University (METU) Session Co-Chair(s): **John Clark**, AFRL/RQTT
4:00	GT2018:77288 **Effects of Cooling Hole Patterns for a Double-Walled Combustor Liner - Part 1: - Overall Effectiveness Measurements** ***Adam Shrager**, **Karen Thole**, Penn State University; **Dominic Mongillo**, Pratt & Whitney*	GT2018:75881 **Turbine Nozzle Endwall Phantom Cooling with Compound Angled Pressure Side Injection** ***Kevin Liu, Hongzhou Xu, Michael Fox**, Solar Turbines Incorporated*	GT2018:76097 **Design Optimization Of Heat Exchangers For Aero Engines With The Use Of A Surrogate Model Incorporating Performance Characteristics And Geometrical Constraints** ***Christina Salpingidou, Zinon Vlahostergios, Kyros Yakinthos**, Aristotle University of Thessaloniki; **Dimitrios Misirlis**, TEI of Central Macedonia; Aristotle University of Thessaloniki; **Michael Flouros, Fabian Donus**, MTU Aero Engines*
4:30	GT2018:77290 **Effects of Cooling Hole Patterns for a Double-Walled Combustor Liner - Part 2: Flowfield Measurements** ***Adam Shrager, Karen Thole**, Penn State University; **Dominic Mongillo**, Pratt & Whitney*	GT2018:76844 **Effects of Endwall 3D Contouring on Film Cooling Effectiveness of Cylindrical Hole Injections at Different Locations on Vane Endwall** ***Pingting Chen, Hongyu Gao, XUEYING LI, Jing Ren, Hongde Jiang**, Tsinghua University*	GT2018:76236 **EFFECTS OF UPSTREAM STEP GEOMETRY ON AXISYMMERIC CONVERGING VANE ENDWALL SECONDARY FLOW AND HEAT TRANSFER AT TRANSONIC CONDITIONS** ***ZHIGANG LI, Luxuan LIU**, Xi'an Jiaotong University; **Jun Li**, Institute of Turbomachinery, Xi'an Jiaotong Univ; **Ridge Sibold, Wing Ng,** Virginia Tech; **Hongzhou Xu, Michael Fox, S**olar Turbines Incorporated*
5:00			

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	HEAT TRANSFER: GENERAL EXPERIMENTAL HEAT TRANSFER	MARINE	OIL & GAS APPLICATIONS
	Thermal Systems Design and Research	**Design and Development**	**Basics of Rotordynamics Instrumentation and Data Acquisition**
	Technical Session • A1-4 + A1-5 • TD-13-01 Part B	**Technical Session • Event Room • TD-25-01**	**Tutorial Session • Sør-Norge• TD-27-13**
	Session Organizer: **Mike Barringer,** Pennsylvania State University Session Co-Chair(s): **James Downs**, Florida Turbine Technologies Inc	Session Organizer: **Jeffrey Patterson**, NSWCPD Session Co-Chair(s): **Andy Cullis**, Woodward	Session Organizer: **Meera Day Towler,** Southwest Research Institute
4:00	GT2018:75334 **Experimental Evaluations of the Relative Contributions to Overall Effectiveness in Turbine Blade Leading Edge Cooling** ***Carol Bryant,*** *United States Air Force;* ***Connor Wiese,*** *Air Force Research Laboratory;* ***James L. Rutledge,*** *Air Force Institute of Technology;* ***Marc D. Polanka,*** *AFIT/ENY*	GT2018:75493 **THERMODYNAMIC PERFORMANCE ENHANCEMENT OF MARINE GAS TURBINE BY USING DETONATION COMBUSTION** ***Ningbo Zhao, Hongtao Zheng,*** *Harbin Engineering University;* ***Xueyou Wen, Dongming Xiao,*** *Harbin Marine Boiler & Turbine Research Institute*	GT2018:77476 **Basics of Rotordynamics Instrumentation and Data Acquisition** ***Meera Day Towler, Timothy Allison,*** *Southwest Research Institute*
4:30	GT2018:75846 **Unsteady Effects on the Experimental Determination of Overall Effectiveness** ***James L. Rutledge, William P. Baker,*** *Air Force Institute of Technology*	GT2018:75908 **A NOVEL COGAG PROPULSION SYSTEM FOR MARINE SHIPS** ***Zhenzhong Xu, Xueyou Wen, H****arbin Marine Boiler & Turbine Research Institute;* ***Ningbo Zhao****, Harbin Engineering University*	**T U T O R I A L**
5:00	GT2018:76225 **Detailed Studies on the Flow Field and Heat Transfer Characteristics inside a Realistic Serpentine Cooling Channel with a S-shaped Inlet** ***Ken-ichi Funazaki, Hikaru Odagiri,*** *Iwate University;* ***Takeshi Horiuchi, Masahide Kazari,*** *Kawasaki Heavy Industries, Ltd.*	GT2018:76928 **Development and Testing of the Hybrid Electric Drive Program for the US Navy's DDG 51 Class Ships** ***Gianfranco Buonamici, Michael Schauble,*** *Naval Surface Warfare Center, Philadelphia Division*	

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Aeroelastic Design and Flutter Mitigation Mechanisms	**Fluid Film Bearings 1**	**Dynamics of Bladed Disks with Nonlinearities**
	Technical Session • E-8 • TD-36-01 Part B	**Technical Session • E-6 • TD-34-11**	**Technical Session • E-7 • TD-35-07 Part B**
	Session Organizer: **Yoon Choi**, GE Aviation Session Co-Chair(s): **Toshinori Watanabe**, The University of Tokyo	Session Organizer: **Kostandin Gjika,** Honeywell Transportation Systems Session Co-Chair(s): **Aurelian Fatu**, University of Poitiers - Institut Pprime	Session Organizer: F**abrice Thouverez,** Laboratory of Tribology and Systems Dynamics Session Co-Chair(s): **Stefano Zucca**, Politecnico Di Torino - DIMEAS
4:00	GT2018:76889 **IMPROVING THE FLUTTER MARGIN OF AN UNSTABLE FAN BLADE** ***Sina C. Stapelfeldt, Mehdi Vahdati,*** *Imperial College London*	GT2018:75887 **INVESTIGATION OF AIR-OIL DISTRIBUTION OF LOW OIL-SUPPLIED PRESSURE GROOVED RING FLOATING RING BEARING** ***Yan Wang, Yuhong Li****, Tsinghua University*	GT2018:75709 **Dynamic analysis and reduction of a cyclic symmetric system subjected to geometric nonlinearities** ***Adrien Martin,*** *Ecole Centrale de Lyon;* ***Fabrice Thouverez****, Laboratory of Tribology and Systems Dynamics*
4:30	GT2018:75958 **Conceptual Flutter Analysis of Labyrinth Seals Using Analytical Models. Part I: Theoretical Support** ***Roque Corral****, Industria de Turbopropulsores S.A;* ***Almudena Vega****, SIEMENS Gamesa*	GT2018:75593 **Development of High Specific Load and Low Mechanical Loss Journal Bearing with Two Pads of Tilting Supported Type** ***Takashi Nakano, Yuichiro Waki, Yuki Sumi, Chihiro Yoshimine,*** *Mitsubishi Hitachi Power Systems, Ltd;* ***Teruaki Yamawaki,*** *Mitsubishi Heavy Industry*	GT2018:76545 **A method for parametric analysis of stability boundaries of nonlinear periodic vibrations for structures with contact interfaces** ***Evgeny Petrov****, The University of Sussex*
5:00	GT2018:75831 **Conceptual Flutter Analysis of Labyrinth Seals Using Analytical Models. Part II: Physical Interpretation** ***Almudena Vega****, SIEMENS Gamesa;* ***Roque Corral****, Industria de Turbopropulsores S.A.*	GT2018:76991 **Application of Dry-Friction Whip and Whirl Solution Methods to Systems with Support Asymmetry** ***Jason Wilkes****, Southwest Research Institute*	

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DEPOSITION, EROSION, FOULING, AND ICING
	Fan & Compressor Stability	**Low Pressure Turbine Aerodynamics II**	**Deposition Modeling - II**
	Technical Session • E-4 • TD-39-02 Part B	**Technical Session • E-2 • TD-41-04 Part B**	**Technical Session • E-5 • TD-47-05 Part B**
	Session Organizer: **Dr. Yuan Dong,** Pratt and Whitney Session Co-Chair(s): **Anna M. Young,** University of Cambridge	Session Organizer: **Domenico Borello,** Sapienza University of Rome	Session Organizer: **Paolo Venturini,**Dipartimento di Meccanica e Aeronautica, 'Sapienza Session Co-Chair(s): **Jeffrey P. Bons,** Ohio State University
4:00	GT2018:75153 **Stall Inception in Low Pressure Ratio Fans** ***Semi Kim, Graham Pullan,*** *University Of Cambridge;* ***Cesare A. Hall,*** *Whittle Laboratory;* ***Robert P. Grewe,*** *Siemens AG, Division Power and Gas, Large Gas Turbines;* ***Mark Wilson****, Rolls-Royce;* ***Ewan Gunn****, Turbostream Ltd*	GT2018:76737 **SECONDARY FLOWS IN LPT CASCADES: NUMERICAL AND EXPERIMENTAL INVESTIGATION OF THE IMPACT OF THE INNER PART OF THE BOUNDARY LAYER** ***Matteo Giovannini, Filippo Rubechini, Michele Marconcini,*** *University of Florence;* ***Daniele Simoni****, DIMSET University of Genova;* ***Vianney Yepmo****, Università degli Studi di Genova;* ***Francesco Bertini****, Avio Aero*	GT2018:75268 **Experimental and Numerical Investigation of Environmental Barrier Coated CMC Turbine Airfoil Erosion** ***Yoji Okita, Yousuke Mizokami, Jun Hasegawa,*** *IHI Corporation*
4:30	GT2018:76322 **A three-dimensional analytical stability model of contra-rotating compressors based on partial simplification of Euler equation** ***Weixiong Chen, Yangang Wang, Hao Wang,*** *Shuanghou Deng, Northwestern Polytechnical University;* ***Haiqi Qin,*** *AECC commercial aircraft engine co., LTD*	GT2018:75475 **Interaction Phenomena Of High Frequency Pulsed Blowing In LP Turbine-like Boundary Layers At High Speed Test Conditions** ***Valentin Bettrich****, University of the German Federal Armed Forces Munich;* ***Reinhard Niehuis****, Universitaet der Bundeswehr Muenchen;* ***Martin Bitter****, Universitat der Bundeswehr Munchen*	GT2018:75044 **Development of High-Temperature High-Velocity Sand Erosion Apparatus** ***Masaya Suzuki, Takashi Yamane,*** *Japan Aerospace Exploration Agency*
5:00	GT2018:75235 **The Effect of Water Ingestion on the Tip Clearance Flow in Compressor Rotors** ***Lu Yang, Qun Zheng, Hai Zhang,*** *Harbin Engineering University;* ***Xiaocui Wu****,* ***Desheng Qin****, Beijing Power Machinery Institute*	GT2018:76450 **LES and RANS analysis of the end-wall flow in a linear LPT cascade with variable inlet conditions, Part II: Loss generation.** ***Michele Marconcini, Roberto Pacciani, Andrea Arnone,*** *University Of Florence;* ***Vittorio Michelassi****,* ***Baker Hughes*** *GE;* ***Richard Pichler****,* ***Yaomin Zhao****,* ***Richard Sandberg****, The University of Melbourne*	GT2018:76251 **MODELING DEPOSITION IN TURBINE COOLING PASSAGES WITH TEMPERATURE DEPENDENT ADHESION AND MESH MORPHING** ***Christopher Bowen, Nathan Libertowski, Mehdi Mortazavi, Jeffrey Bons,*** *Ohio State University*

TUESDAY, JUNE 12 — 4:00 - 5:30 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY	MANUFACTURING MATERIALS & METALLURGY
	LES and DNS Methods and Applications	**Centrifugal Compressors: Performance & Flow Control**	**Structural Loads, Aeroelasticity and Noise**	**Additive Manufacturing for Industrial Gas Turbines and Parts**
	Technical Session • E-3 • TD-42-01 Part B	**Technical Session • E-1 • TD-44-08 Part B**	**Technical Session • Hordaland • TD-48-02 Part B**	**Panel Session • Hall B4 • TD-24-18**
	Session Organizer: **Chunill Hah,** NASA Glenn Session Co-Chair(s): **Rob Watson**, University of Cambridge	Session Organizer: **Luca Porreca**, MAN Diesel & Turbo Schweiz AG Session Co-Chair(s): **Hamid Hazby**, PCA Engineers Limited	Session Organizer: **George Pechlivanoglou**, HFITU Berlin Session Co-Chair(s): **Juan Jauregui**, UNIVERSIDAD AUTONOMA DE QUERETARO; **Alexandrina Untaroiu**, Virginia Tech	Session Organizer: **Henry Bernstein,** Gas Turbine Materials Assoc
4:00	GT2018:75523 **Comparison of Various CFD Codes for LES Simulations of Turbomachinery: From Inviscid Vortex Convection to Multi-stage Compressor** ***Vincent Brunet, Emma Croner,*** *Safran;* ***Jerome de Laborderie, Eric Lippinois,*** *Safran Aircraft Engine; Alexandre Minot, Safran Tech;* ***Stephane Richard,*** *Safran Helicopter Engines;* ***Jean-Francois Boussuge, Jerome Dombard, Florent Duchaine, Laurent Gicquel, Thierry Poinsot, Guillaume Puigt, Gabriel Staffelbach, Luis Segui, Olivier Vermorel, Nadege Villedieu,*** *CERFACS;* ***Jean-Sebastien Cagnogne,*** *Conseil National de Recherches Canada;* ***Koen HILLEWAERT, Michel Rasquin,*** *Cenaero;* ***Ghislain Lartigue, Vincent Moureau,*** *CORIA;* ***Vincent Couaillier, Emeric Martin, Marta de la Llave Plata, Florent Renac, Jean-Marie Le Gouez,*** *ONERA*	GT2018:77022 **ASSESSMENT OF FLOW CONTROL STRATEGIES FOR IMPROVING CENTRIFUGAL COMPRESSOR EFFICIENCY** ***Farzad Ashrafi, Huu Duc Vo,*** *Ecole Polytechnique de Montreal*	GT2018:75922 **Benchmark of a Novel Aero-Elastic Simulation Code for Small Scale VAWT Analysis** ***David Marten,*** *TU Berlin – ISTA;* ***Matthew Lennie,*** *TU Berlin;****George Pechlivanoglou,*** ***Christian Oliver Paschereit,*** *H.F.I TU Berlin;* ***Lorenzo Ferrari,*** *University of Pisa – DESTEC;* ***Giovanni Ferrara, Alessandro Bianchini,*** *University of Florence*	GT2018:77619 **Status of Additive Manufacturing at Siemens** *Vladimir Navrotsky, Siemens* GT2018:77620 **Status of Additive Manufacturing at MHPS** *Masahito Kataoka, MHPS* GT2018:77622 **Status of Additive Manufacturing at General Electric** *Massimiliano Cecconi, General Electric* GT2018:77621 **Status of Additive Manufacturing** at Ansaldo *Uwe Ruedel, Ansaldo Energia Switzerland*
4:30	GT2018:75730 **Large Eddy Simulations of a Highly Loaded Transonic Blade With Separated Flow** ***Mael Harnieh, Laurent Gicquel, Florent Duchaine,*** *CERFACS*	GT2018:77023 **Large Eddy Simulations in a Transonic Centrifugal Compressor** ***Jerome Dombard, Florent Duchaine, Laurent Gicquel, Gabriel Staffelbach,*** *CERFACS;* ***Nicolas Buffaz,*** *Safran Helicopter Engines;* ***Isabelle Trebinjac,*** *Ecole Centrale de Lyon*		**P** **A** **N** **E** **L**
5:00	GT2018:75733 **High Fidelity Spectral/hp Element Methods for Turbomachinery** ***Andrea Cassinelli, Francesco Montomoli, Spencer J. Sherwin,*** *Imperial College London;* ***Paolo Adami,*** *Rolls-Royce Deutschland*	GT2018:75365 **Experimental Application of a Boundary Layer Control Strategy in a Radial Vaned Diffuser** ***Victor Moδnne-Loccoz,*** *Safran Helicopter Engines;* ***Isabelle Trebinjac, Pierre Laucher,*** *Ecole Centrale de Lyon*		

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Basics of Gas Turbine Engines	**Ignition & Auto-Ignition II**	**Alternative Fuels Fundamentals**
	Tutorial Session • Jan Mayen 2 • WA-1-17	**Technical Session • A1-1 • WA-4-31**	**Tutorial Session • A1-2 • WA-4-39**
	Session Organizer: **Keith Boyer**, Practical Aeronautics	Session Organizer: **Holger Streb**, Siemens AG Session Co-Chair(s): **Michael Huth**, Siemens; **Bernd Prade**, Siemens AG KWU	Session Organizer: **Jeff Bergthorson**, McGill University Session Co-Chair(s): **Gilles Bourque**, Siemens Canada
8:00	GT2018:77431 **Basics of Aircraft Gas Turbine Engine (GTE) Core** ***Keith Boyer**, Practical Aeronautics; **Kenneth Van Treuren**, Baylor University* **T U T O R I A L**	GT2018:75483 **Influence of Autoignition Kernel Development on the Flame Stabilisation of Hydrogen-Nitrogen Mixtures in Vitiated Air of High Temperature** ***Christoph Alexander Schmalhofer, Peter Griebel, Manfred Aigner**, German Aerospace Centre*	GT2018:77452 **Basics of Alternative Fuel Combustion and Emissions - Joint Session between Combustion, Fuels & Emissions and Coal, Biomass & Alternative Fuels committees** ***Jeffrey Bergthorson**, McGill University; **Gilles Bourque**, Siemens Canada* **T U T O R I A L**
8:30		GT2018:75570 **HIGH MACH IGNITION IN A SWIRL STABILIZED LEGACY COMBUSTOR** ***Justin Gross, Andrew Caswell, Craig Neuroth**, Air Force Research Laboratory; **Bethany Huelskamp**, Innovative Scientific Solutions, Inc.*	
9:00		GT2018:76840 **Flame and spray dynamics during the light-round process in an annular system equipped with multiple swirl spray injectors** ***Kevin Prieur**, Laboratoire EM2C, CNRS, Centralesupélec, Safran Tech; **Daniel Durox**, EM2C Lab CNRS Centralesupélec; **Guillaume Vignat**, **Sebastien Candel**, Laboratoire EM2C, CNRS UPR288; **Thierry Schuller**, CNRS and Ecole Centrale Paris*	
9:30		GT2018:77146 **Experimental Investigation into the High Altitude Relight of a Three-Cup Combustor Sector** ***Michael Denton, Samir Tambe, San-Mou Jeng**, University of Cincinnati*	

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	COMBUSTION, FUELS & EMISSIONS	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	CYCLE INNOVATIONS
	Combustion Dynamics: Modeling II	**The Gas Turbine Life Cycle Through a Data Analytics Lens**	**Cycle Innovations in Small Scale Applications II**
	Technical Session • Jan Mayen 3 • WA-4-20	**Panel Session • Jan Mayen 1 • WA-5-14**	**Technical Session • Hordaland • WA-6-03**
	Session Organizer: **Jacqueline O'Connor**, Pennsylvania State University Session Co-Chair(s): **Janith Samarasinghe**, GE Global Research	Session Organizer: **Shawn Gregg**, Delta Air Lines	Session Organizer: **Valentina Zaccaria**, Malardalen University Session Co-Chair(s): **Alessio Abrassi**, University of Genoa
8:00	GT2018:75552 **The Identification and Prediction of Helical Modes Induced by a Multi-Passage Swirl Stabilised Lean Burn Aero-Engine Fuel Injector under Steady State and Acoustically Forced Conditions** ***Nicholas Treleaven, Jialin Su, Andrew Garmory, Gary J. Page,*** *Loughborough University;* ***Matthew Juniper,*** *University of Cambridge*	GT2018-77633 **The Gas Turbine Life Cycle Through a Data Analytics Lens** ***Atul Kohli****, Pratt & Whitney* GT2018-77634 **The Gas Turbine Life Cycle Through a Data Analytics Lens** ***Salvatore A. DellaVilla, Jr.****, Strategic Power* Systems, *Inc* GT2018-77635 **The Gas Turbine Life Cycle Through a Data Analytics Lens** ***Friedhelm Kappei****, MTU Maintenance Hannover GmbH* GT2018-77645 **The Gas Turbine Life Cycle Through a Data Analytics Lens** ***Rodolphe Parisot****, AFI KLM E&M*	GT2018:76696 **Micro Gas Turbine Cycle Humidification for Increased Flexibility: Numerical and Experimental Validation of different steam injection models** ***Ward De Paepe, Francesco Contino, Marina Montero Carrero,*** *Vrije Universiteit Brussel; Massimiliano Renzi, Carlo Caligiuri, Free University of Bozen/Bolzano; Vrije Univ Brussel*
8:30	GT2018:75361 **Effects of nonlinear modal interactions on the thermoacoustic stability of annular combustors** ***Alessandro Orchini, Georg Atta Mensah,*** *Technische Universitat* ***Berlin; Jonas P. Moeck,*** *TUB/NTNU*		GT2018:77084 **PERFORMANCE ASSESSMENT OF A MICRO GAS TURBINE CYCLE WITH EXHAUST GAS RECIRCULATION FUELED BY BIOGAS FOR POST-COMBUSTION CARBON CAPTURE APPLICATION** *Homam Nikpey Somehsaraei, Mohsen Assadi, University of Stavanger; Mohammad Mansouri Majoumerd, International Research Institute of Stavanger*
9:00	GT2018:75559 **Validation of a Physics-Based Low-Order Thermo-Acoustic Model of Combustion Driven Oscillations in a Liquid Fueled Gas Turbine Combustor** ***Michael Knadler, Thomas Caley, Jong Guen Lee,*** *University of Cincinnati;* ***Seungchai Jung, Shaun Kim, Heeho Park,*** *Hanwha Techwin*	**P A N E L**	GT2018:77265 **HUMIDIFIED MICRO GAS TURBINE FOR CARBON CAPTURE APPLICATIONS: PRELIMINARY EXPERIMENTAL RESULTS WITH CO_2 INJECTION** *Simone Giorgetti, Alessandro Parente, Universite Libre de Bruxelles; Laurent Bricteux, Universite de Mons (UMONS); Francesco Contino, Ward De Paepe, Vrije Universiteit Brussel*
9:30	GT2018:75644 **Quantification and Propagation of Uncertainties in Identification of Flame Impulse Response for Thermoacoustic Stability Analysis** ***Shuai Guo, Camilo Silva, Abdulla Ghani, Wolfgang Polifke,*** *Technische Universitat Munchen*		GT2018:75979 **MODEL BASED DIAGNOSTICS OF AE-T100 MICRO HUMID AIR TURBINE CYCLE** *Mariam Mahmood, Alessio Martini, Aristide F. Massardo, Univ Of Genoa; Ward De Paepe, Vrije Universiteit Brussel*

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	HEAT TRANSFER: NUMERICAL FILM COOLING	HEAT TRANSFER: NUMERICAL INTERNAL COOLING
	Air System Pre-Swirl and Analysis	**Numerical simulation of novel film cooling design**	**Leading Edge and Tip Cooling**
	Technical Session • A1-4 + A1-5 • WA-15-01	**Technical Session • A1-6 • WA-12-04**	**Technical Session • A1-3 • WA-11-02**
	Session Organizer: **Riccardo Da Soghe**, Ergon Research Session Co-Chair(s): **Peter Childs**, Imperial College London	Session Organizer: **Khosro MollaHosseini**, Honeywell Aerospace Session Co-Chair(s): **Julia Ling**, Citrine Informatics	Session Organizer: **Antonio Andreini**, University of Florence Session Co-Chair(s): **Lorenzo Winchler**, University of Florence
8:00	GT2018:75112 **Assessment of Wall Modeled LES for Pre-swirl Cooling Systems** ***Mazhar E. Kusbeci, John Chew,*** *University of Surrey*	GT2018:75918 **Enhanced Heat Transfer and Thermal Performance of a Blade with Tree-shaped Film Cooling Channels** ***Guohua Zhang, Gongnan Xie,*** Northwestern *Polytechnical University;* ***Bengt Sunden,*** *Lund University*	GT2018:75445 **Effects of Impinging Hole Shapes on Double Swirl Cooling Performance at Gas Turbine Blade Leading Edge** ***Junfei Zhou, XINJUN WANG, Jun Li, Daren Zheng,*** *Xi'An Jiaotong University*
8:30	GT2018:75671 **MEASUREMENT OF PRESSURES AND TEMPERATURES IN A COVER-PLATE PRE-SWIRL SYSTEM** ***Wu Heng, Liu Gaowen, Wu Zhipeng, Feng qing, Yangang Wang,*** *Northwestern Polytechnical University*	GT2018:76380 **New Designs of Novel Shaped Holes based on Cylindrical Configurations for Improving Film Cooling Effectiveness** ***Rui Zhu, Gongnan Xie,*** *Northwestern Polytechnical University;* ***Terrence Simon,*** *Univ Of Minnesota*	GT2018:76156 **Effect of Coolant Mass Flow Rate of Dirt Purge Hole on Heat Transfer and Flow Characteristics at a Turbine Blade Tip Underside** ***Zhiqi Zhao, Lei Luo, Songtao Wang, Xun Zhou,*** *Harbin Institute of Technology*
9:00	GT2018:76255 **Design and Validation of a Pre-swirl System in the Newly Developing Gas Turbine for Power Generation** ***Donghwa Kim,*** *Doosan Heavy Industries and Construction;* ***Hyungyu Lee, Jungsoo Lee, Jinsoo Cho,*** *Hanyang Univeristy*	GT2018:75314 **A Porous Media Function that Mimics the Effect of Discrete Holes** ***David Cerantola, A.M.*** *Birk, Queen's University*	GT2018:76547 **Flow and Heat Transfer Characteristics in a Model of Turbine Blade Tip-Wall with Three Kinds of Turning Vanes** ***Bin Wu, Xing Yang, Lv Ye, Zhao LIU, Yu Jiang, Qiang Zhao, Zhenping Feng,*** *Xi'An Jiaotong University*
9:30	GT2018:76323 **Pre-swirl System Design Including Inlet Duct Shape by Using CFD Analysis** ***Hyungyu Lee, Jungsoo Lee, Sangwook Kim, Jinsoo Cho,*** *Hanyang Univeristy;* ***Donghwa Kim,*** *Doosan Heavy Industries and Construction*		

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	INDUSTRIAL & COGENERATION	MANUFACTURING MATERIALS & METALLURGY	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES
	Gas Turbine Applications Involving Heavy Fuel Oils and Crude Oils	**Additive Manufacturing Equipment and Processes**	**Turbochargers - Turbines 1**
	Tutorial Session • Sør-Norge• WA-23-07	**Technical Session • Svalbard • WA-24-04**	**Technical Session • Oslo • WA-26-02**
	Session Organizer: **Simon Kloter**, Turbotect Ltd. Session Co-Chair(s): **Jean-Pierre Stalder,** Turbotect	Session Organizer: Session Co-Chair(s): **Nejib Chekir**, Liburdi	Session Organizer: **Tom Heuer**, Borg Warner Turbo Systems Engineering Gmbh
8:00	GT2018:77646 **Gas Turbine Applications Involving Heavy Fuel Oils and Crude Oils** ***Simon Kloter**, Turbotect Ltd.* GT2018:77646 Gas Turbine Applications Involving Heavy Fuel Oils and Crude Oils Simon Kloter, Turbotect Ltd.	GT2018:75119 **Assessing the feasibility of micro-plasma technology for additive manufacturing** ***Jason Nagy**, McMaster University; **Xiao Huang**, Carleton University*	GT2018:76490 **METHOD FOR NON-DIMENSIONAL TIP LEAKAGE FLOW CHARACTERIZATION IN RADIAL TURBINES** ***Jose Ramon Serrano, Roberto Navarro, Luis Miguel Garcia Cuevas, Lukas Benjamin Inhestern**, Universitat Politecnica de Valencia*
8:30	**T U T O R I A L**	GT2018:75862 **New Welding Material and Technologies for Repair and 3D Additive Manufacturing of Turbine Engine Components of High Gamma Prime Nickel Based Superalloys** ***Alex Gontcharov, Paul Lowden, Yuan Tian**, Liburdi Engineering Ltd; R**obert Tollett,** Liburdie Turbine Services Inc; **Mathieu Brochu**, McGill University*	GT2018:75403 **Design of a variable geometry axial-inflow turbine turbocharger** ***Apostolos Pesyridis**, Brunel University; **Raffaele Tuccillo**, **Alessandro Cappiello**, Univ Of Naples*
9:00		GT2018:76614 **Development and Material Characterization of an Additively Manufactured Nickel Alloy for Turbine Applications** ***Rosenbarger Thomas, Joshua McNally**, Power Systems Mfg LLC; **Edwin Kawecki**, PSM; **David Day**, PSM - Ansaldo Energia Group*	GT2018:76378 **Design of an air-cooled radial turbine. Part 1: Computational modelling** ***Yang Zhang, Tomasz Duda, James Scobie, Carl Sangan, Colin Copeland**, University of Bath; **Alex Redwood**, HiETA Technologies*
9:30		GT2018:76924 **Process Optimization of Wire based Laser Metal Deposition of Titanium** ***Martin Schulz, Jan Riepe, Nils Klingbeil, Kristian Arntz, Fritz Klocke**, Fraunhofer IPT*	GT2018:76384 **Design of an air-cooled radial turbine. Part 2: Experimental Measurements of Heat Transfer** ***Yang Zhang, Tomasz Duda, James Scobie, Carl Sangan, Colin Copeland**, University of Bath; Alex Redwood, HiETA Technologies*

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	OIL & GAS APPLICATIONS	STEAM TURBINES	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING
	Surge and Stall	**General Design Aspects**	**Forced Response II**
	Technical Session • Nord-Norge • WA-27-04	**Technical Session • Romerike • WA-29-06**	**Technical Session • E-7 • WA-36-05**
	Session Organizer: **Natalie Smith,** Southwest Research Institute Session Co-Chair(s): **Joseph Thorp**, Aramco Services	Session Organizer: **Michael Wechsung**, Siemens Session Co-Chair(s): **Thomas Polklas**, MAN Turbo AG	Session Organizer: **Roque Corral**, Industria de Turbopropulsores S.A. Session Co-Chair(s): **Tobias R. Muller,** University of Stuttgart
8:00	GT2018:75521 **Development of a criterion for a robust identification of diffuser rotating stall onset in industrial centrifugal compressors** ***Alessandro Bianchini, Giulia Andreini, Giovanni Ferrara,*** *University of Florence;* ***Lorenzo Ferrari,*** *University of Pisa – DESTEC;* ***Dante Tommaso Rubino,*** *Baker Hughes, a GE company*	GT2018:75066 **Digitalization: Laser metal deposition - The future of spare parts and repairs for industrial steam turbines** ***Norman Wittig,*** *Siemens AG*	GT2018:76344 **NUMERICAL AND EXPERIMENTAL FSI-STUDY TO DETERMINE MECHANICAL STRESSES INDUCED BY ROTATING STALL IN UNSHROUDED CENTRIFUGAL COMPRESSOR IMPELLERS** ***Bob Mischo, Philipp Jenny, Sebastiano Mauri, Yves Bidaut, Max Kramer,*** *MAN Diesel Turbo Schweiz AG;* ***Sebastian Spengler,*** *MAN Diesel & Turbo SE*
8:30	GT2018:77222 **A Novel Approach to Surge Control: High-Frequency Pressure Variance as an Indicator of Impending Surge in Centrifugal Compressors** ***Meera Day Towler, Timothy Allison,*** *Southwest Research Institute;* ***Paul Krueger,*** *Southern Methodist University;* ***Karl Wygant,*** *Hanwha Power Systems*	GT2018:76766 **OPTIMIZATION OF A 900 MM TILTING-PAD JOURNAL BEARING IN LARGE STEAM TURBINES BY ADVANCED MODELING AND VALIDATION** ***Umit Mermertas,*** *Siemens AG Power and Gas Division Steam Turbines;* ***Thomas Hagemann,*** *Technical University of Clausthal;* ***Clement Brichart,*** *Engie Laborelec*	GT2018:76352 **Numerical Investigation on Wide-chord Fan Blade Forced Response Due to Vortex Ingestion** ***Zhonglin Wang, Yong Chen,*** *HUA OUYANG,* ***Anjenq Wang,*** *Shanghai Jiao Tong University*
9:00	GT2018:76179 **An Advanced Surge Dynamic Model For Simulating ESD Events and Comparing Different Anti-Surge Strategies** ***Enrico Munari, Michele Pinelli,*** *University of Ferrara;* ***Mirko Morini,*** *University of Parma;* ***Klaus Brun, Sarah Simons, J. Jeffrey Moore,*** *Southwest Research Institute;* ***Rainer Kurz,*** *Solar Turbines*	GT2018:76394 **Thermal System Optimization and Energy Grade Analysis of 700: HUSC Steam Turbine Using a EC System** ***Haiyu He, Tao Chen, Shiwang Fan, Xiaohua Xia, Fang Zhang, Jie Yu, Rui Yang, Jiandao Yang,*** *Shanghai Turbine Works Co., Ltd*	GT2018:76629 **Damping Behavior of Acoustic Dominant Modes in an Aeroacoustic Test Rig Representing a Simplified Geometry of a High Pressure Radial Compressor** ***Botond Barabas, Dieter Brillert, Hans Josef Dohmen, Friedrich-karl Benra,*** *Univ of Duisburg-essen*
9:30	GT2018:76185 **A New Index To Evaluate The Potential Damage Of a Surge Event: The Surge Severity Coefficient** ***Enrico Munari, Michele Pinelli,*** *University of Ferrara;* ***Mirko Morini,*** *University of Parma;* ***Klaus Brun, Sarah Simons,*** *Southwest Research Institute;* ***Rainer Kurz,*** *Solar Turbines*	GT2018:76395 **Development of a new high-strength steel for low pressure steam turbine end stage blades** ***Hannes Teuber, Jochen Barnikel, Michael Dankert, Walter David, Andrei Ghicov, Simon Voss,*** *Siemens AG, Power & Gas Division*	GT2018:77094 **Aeromechanical Response of a Distortion Tolerant Boundary Layer Ingesting Fan** ***Andrew Provenza,*** *NASA;* ***Kirsten Duffy,*** *University of Toledo;* ***Milind Bakhle,*** *NASA Glenn Research Center*

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: ROTORDYNAMICS
	Seals 1	**Creep and Themomechanical Fatigue Modelling**	**Rotordynamics V - Bearings and Seal Flows 1**
	Technical Session • E-6 • WA-34-01	**Technical Session • E-8 • WA-31-02**	**Technical Session • Event Room • WA-33-05**
	Session Organizer: **Mihai Arghir**, Universite De Poitiers - Instit Pprime, D3	Session Organizer: **Roland Muecke**, Ansaldo Energia Session Co-Chair(s): **Sachin Shinde**, Siemens Energy, Inc; **Thomas J. Martin**, United Technologies Research Center; **Martin Hughes**, Siemens Industrial Turbomachinery Ltd.	Session Organizer: **Ali Gordon**, Univ Of Central Florida Session Co-Chair(s): **Feng Kai**, Hunan University
8:00	GT2018:75200 **LEAKAGE AND DYNAMIC FORCE COEFFICIENTS OF A THREE-WAVE (AIR IN OIL) WET ANNULAR SEAL: MEASUREMENTS AND PREDICTIONS** ***Xueliang Lu, Luis San Andres,*** *Texas A&M University*	GT2018:75813 **Characterizing The Influence Of Cyclic Re-Priming On The Prediction Of Long Term Creep Damage For Gas Turbine Component**s ***Richard Green, Richard S Bellows,*** *Solar Turbines Inc;* ***Jonathan Douglas,*** *Frazer-Nash Consultancy Ltd;* ***Andrew Moffat****, Frazer-Nash Consultancy*	GT2018:75271 **Coupled Analysis of the Rotor-dynamic Fluid Forces in the Annular Plain Seal and the Shaft Vibration** ***Kenjiro Miyake,*** *Nagoya University;* ***Atsushi Ikemoto****,* ***Tsuyoshi Inoue****, Nagoya University;* ***MASAHARU UCHIUMI****, Muroran institute of Technology*
8:30	GT2018:75325 **Static and Rotordynamic Characteristics of a Liquid Annular Seal with a Circumferentially-Grooved Stator and Smooth Rotor Using Three Levels of Circumferential Inlet-Fluid Rotation** ***Dara Childs****, Texas A & M Univ;* ***Jose Torres****, Exxon Mobil;* ***Joshua Bullock****, Valero Energy*	GT2018:75838 **A MEAN STRESS CORRECTION TO A DUCTILITY EXHAUSTION APPROACH FOR GAS TURBINE COMPONENT LIFE ASSESSMENT** ***Richard Green, Christopher Meyer,*** *Solar Turbines Inc;* ***Jonathan Douglas, Andrew Moffat,*** *Frazer-Nash Consultancy*	GT2018:76065 **Safety Design Methods for Rotor-Bearing System and Dynamic Analysis in Aero-Engines** ***Jie Hong, Tianrang Li, Zhichao Liang, Dayi Zhang, Yanhong Ma, Yongfeng Wang,*** *Beihang University*
9:00	GT2018:75328 **Experimental Study of the Leakage and Rotordynamic Coefficients of a Long Smooth Seal with Two-Phase, Mainly-Oil Mixtures** ***Min Zhang, Dara Childs, James E. Mclean Jr., Dung L. Tran, Hari Shrestha,*** *Texas A&M Turbomachinery Laboratory*	GT2018:75974 **Improved Low Cycle Fatigue Analysis for Ni-based Turbine Nozzles** ***Gianluca Maggiani****,* ***Simone Colantoni****, Baker Hughes a GE Company;* ***Matthew Roy, Philip Withers,*** *University of Manchester*	GT2018:76746 **The Dynamic Load of Inter-shaft Bearing and Its Transmission Characteristic of Complex Rotor System** ***Jie Hong, Yanhong Ma,*** *Beihang University;* ***Huan Yu****, Beihang University;* ***Bo Sun****, AECC Shenyang Engine Design and Research Institute, Aero Engine (Group)Corporation of China*
9:30	GT2018:77140 **On the Leakage, Torque and Dynamic Force Coefficients of an Air in Oil (Wet) Annular Seal: a CFD Analysis Anchored to Test Data** ***Luis San Andres, Jing Yang, Xueliang Lu,*** *Texas A&M University*	GT2018:77283 **The Influence Of Thermal Transient Rates On Coated Turbine Parts Life Expectancy** ***Thomas J. Martin, Alexander Staroselsky, Luke Borkowski,*** *United Technologies Research Center*	GT2018:77210 **An Investigation Of The Static Performance Of The Non-Circular Journal Bearing Using Fourier Analysis** ***Jiale Tian, Baisong Yang, Jian Zhou, Lie Yu,*** *Xi'An Jiaotong Unviersity*

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY
	Supercritical CO2 Power Cycle Modeling and Fluid Properties	**Flow Control - 2**	**Preliminary Design Methods (2)**
	Tutorial Session • Akershus • WA-38-14	**Technical Session • E-3 • WA-39-12**	**Technical Session • E-2 • WA-42-10**
	Session Organizer: **Douglas Hofer**, GE Global Research Session Co-Chair(s): **Anton Moisseytsev**, Argonne National Laboratory	Session Organizer: **Tianyu Pan**, Duke University/Beihang University Session Co-Chair(s): **Christoph Brandstetter**, Ecole Centrale de Lyon	Session Organizer: **Milan Petrovic**, University of Belgrade Session Co-Chair(s): **Alexander Wiedermann**, Man Diesel & Turbo SE
8:00	GT2018:77461 **Supercritical CO2 Power Cycle Modeling and Fluid Properties Tutorial** ***Douglas Hofer,*** *GE Global Research;* ***Anton Moisseytsev****, Argonne National Laboratory*	GT2018:76052 **Numerical Investigation of a Sweeping Jet Actuator for Active Flow Control in a Highly Loaded Compressor Cascade** ***Qinghe Meng, Chen Shaowen, Weihang Li, Songtao Wang****, Harbin Institute of Technology*	GT2018:75089 **AERO-THERMAL COUPLED PREDICTIVE MODEL FOR PRELIMINARY GAS TURBINE BLADE COOLING ANALYSIS** ***Wei Ba, Long-gang Liu, Hong Liu,*** *Tsinghua University*
8:30	T U T O R I A L	GT2018:76072 **THE MECHANISM OF THE FLOW IN THE HUB CORNER AND THE CONTROL BY TAILING EDGE GAPS** ***Zhao Wenfeng, Yu Duan, Zhitao Tian, Qun Zheng, Bin Jiang****, Harbin Engineering University*	GT2018:75194 **Source Terms Based Modeling of Rotating Cavitation in Rocket Turbopumps** ***Adam Vermes, Claudio Lettieri,*** *Delft University of Technology*
9:00		GT2018:76147 **Numerical Investigation of Passive Flow Control Using Wavy Blades in a Highly-loaded Compressor Cascade** ***Bo Wang, Yanhui Wu, Kai Liu,*** *Northwestern Polytechnical University*	GT2018:75362 **Robust Method to Solve Meanline Equations for Choked Flows** ***Jose M. Chaquet, David Cadrecha, Roque Corral, Vicente P. Timon,*** *Industria de Turbo Propulsores S.A*
9:30		GT2018:75222 **INFLUENCE OF OSCILLATING BOUNDARY LAYER SUCTION ON AERODYNAMIC PERFORMANCE IN HIGH LOAD COMPRESSOR CASCADES** ***Hao Xu, Bao Liu, Le Cai, Xun Zhou, Songtao Wang, Zhongqi Wang,*** *Harbin Institute of Technology*	GT2018:75450 **Axial Compressor Performance Prediction Using Improved Streamline Curvature** ***Tao Li, Yadong Wu, HUA OUYANG, Xiaoqing Qiang****, Shanghai Jiao Tong University*

WEDNESDAY, JUNE 13 — 8:00 - 10:00 AM

	TURBOMACHINERY: NOISE, DUCTS AND INTERACTIONS	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY	WIND ENERGY
	Gas Turbine Engine Ducts and Interactions	**Stall and Surge in Centrifugal Compressors I**	**Machine Learning-based Power Curve Methods**
	Technical Session • E-4 • WA-43-03	**Technical Session • E-1 • WA-45-08**	**Tutorial Session • E-5 • WA-48-08**
	Session Organizer: **Franz Malzacher**, MTU Aero Engines AG Session Co-Chair(s): **Deepak Thirumurthy**, Siemens Energy, Inc; **David Cerantola**, Queen's University	Session Organizer: **William Cousins**, United Technologies Research Center Session Co-Chair(s): **Vishnu Sishtla**, UTC Climate, Controls and Security	Session Organizer: **Yu Ding**, Texas A&M University
8:00	GT2018:75185 **Numerical Investigations of an Axial Exhaust Diffuser Coupling the Last Stage of a Generic Gas Turbine** ***Marius Mihailowitsch, Markus Schatz, Damian Vogt,*** *University of Stuttgart*	GT2018:75462 **Evolution Process of Diffuser Stall in a Centrifugal Compressor with Vaned Diffuser** ***Nobumichi Fujisawa, Tetsuya Inui, Yutaka Ohta,*** *Waseda University*	GT2018:77336 **Machine Learning-based Power Curve Methods** ***Yu Ding****, Texas A&M University*
8:30	GT2018:76633 **Numerical Flow Field Analysis in a Highly Bent Intake Duct** ***Jakob P. Haug, Rudolf P.M. Rademakers, Reinhard Niehuis,*** *Bundeswehr University Munich, Institute of Jet Propulsion;* ***Marcel Stößel****, Wehrtechnische Dienststelle für Luftfahrzeuge und Luftfahrtgerät der Bundeswehr*	GT2018:76145 **The Unsteady Pre-stall Behavior of the Spike-Type Rotating Stall Within an Airfoil Vaned-Diffuser** ***Jiayi Zhao, Guang Xi, Zhiheng Wang, Yang Zhao,*** *Xi'an Jiaotong University*	
9:00	GT2018:76324 **Effects of Cavity Purge Flow on Intermediate Turbine Duct Flowfield** ***LIU Jun, Qiang Du, Guang Liu, WANG Pei, LIU Hongrui, Qingzong Xu,*** *Institute of Engineering Thermalphysics, Chinese Academy of Sciences*	GT2018:76149 **NUMERICAL INVESTIGATION OF DIFFUSER ROTATING STALL AND SYSTEM INSTABILITY IN A CENTRIFUGAL COMPRESSOR WITH VANED DIFFUSER** ***yang zhao, Guang Xi, Jiayi Zhao,*** *Xi'an Jiaotong University*	
9:30	GT2018:76649 **NUMERICAL AND EXPERIMENTAL STUDY ON BLEED IMPACT ON INTERMEDIATE COMPRESSOR DUCT PERFORMANCE** ***Elias Siggeirsson, Niklas Andersson,*** *Chalmers University of Technology;* ***Fredrik Wallin****, GKN Aerospace Sweden AB*	GT2018:76597 **Experimental and Numerical Analysis of Unsteady Flow Structure in a Centrifugal Compressor with Variable Vaned Diffuser** ***Xiang Xue, Tong Wang, Yuchang Shao, Bo Yang, Chuangang Gu****, Shanghai Jiaotong University*	

TUTORIAL

KEYNOTE & PLENARIES

The MRO Digital/Data Transformation

Panel Session • Hall B4 • 50-03

Session Organizer: **Shawn Gregg**, Delta Air Lines

GT2018:77572
The MRO Digital/Data Transformation: Bernhard Krugel-Sprengel
***Bernhard Krügel-Sprengel**, Lufthansa Technik AG, HAM T/ES*

GT2018:77573
The **MRO Digital/Data Transformation: Jeff Benoit**
***Jeffrey Benoit**, Power Systems Mfg LLC (PSM)-Ansaldo Energia Group*

P

A

N

E

L

WEDNESDAY, JUNE 13 — 11:15 AM - 12:45 PM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Whole Engine Performance and Novel Concepts II	**Novel Combustor Concept III**	**Combustion Noise**
	Technical Session • Jan Mayen 2 • WB-1-16	**Technical Session • Jan Mayen 3 • WB-4-11**	**Technical Session • A1-1 • WB-4-13**
	Session Organizer: **Kurt Rouser**, Oklahoma State University Session Co-Chair(s): **Reagan Woolf**, US Air Force	Session Organizer: **Jenny Larfeldt**, Siemens Industrial Turbomachinery AB Session Co-Chair(s): **Behdad Ariatabar**, KIT; **Bernd Prade,** Siemens AG KWU	Session Organizer: **Christoph Hirsch**, TU Munchen Session Co-Chair(s): **Nikolaos Zarzalis,** Karlsruhe Institute of Technology (KIT)
11:15	GT2018:76880 **Design and Application of a Multi-disciplinary Pre-design Process for Novel Engine Concepts** ***Stanislaus Reitenbach, Alexander Krumme, Thomas Behrendt, Markus Schnos, Thomas Schmidt, Sandrine Hoenig, Robert Mischke, Erwin Moerland,*** *German Aerospace Center -DLR*	GT2018:76548 **Modelling the Effect of External Flue Gas Recirculation on NOx and CO Emissions in a premixed gas turbine combustor with chemical reactor networks** ***Vaibhav Prakash, Johan Steimes, Dirk J. E. M Roekaerts, Sikke A. Klein,*** *Delft University of Technology, Process and Energy department*	GT2018:75427 **Comparison of Equivalence Ratio Transients on Combustion Instability in Single-Nozzle And Multi-Nozzle Combustors** ***Xiaoling Chen, Wyatt Culler, Stephen Peluso, Domenic Santavicca, Jacqueline O'Connor,*** *Pennsylvania State University*
11:45	GT2018:75180 **Characterization of an Aircraft Auxiliary Power Unit Test Rig for Cycle Optimization Studies** ***Jan Zanger, Thomas Krummrein, Teresa Siebel, Jorgen Roth****, German Aerospace Center (DLR)*	GT2018:76000 **Numerical Investigation on Single-restricted Swirling Flows in an Innovative Combustor** ***Bin Hu, JunHua Zhang, AiMing Deng, Wei Zhao, QingJun Zhao,*** *Institute of Engineering Thermophysics, Chinese Academy of Sciences*	GT2018:76963 **EFFECT OF CHEMICAL COMPOSITION OF SYNGAS ON COMBUSTION DYNAMICS INSIDE BLUFF-BODY TYPE TURBULENT SYNGAS COMBUSTOR** ***Nikhil Baraiya, S. R. Chakravarthy,*** *IIT Madras*
12:15	GT2018:76494 **DIRECT INTEGRATION OF AXIAL TURBOMACHINERY PRELIMINARY AERODYNAMIC DESIGN CALCULATIONS IN ENGINE PERFORMANCE COMPONENT MODELS** ***Ioannis Kolias, Alexios Alexiou, Nikolaos Aretakis, Konstantinos Mathioudakis,*** *National Tech University of Athens*	GT2018:76276 **Investigation of H2/CH4-air flame characteristics of a micromix model burner at atmosphere pressure condition** ***Xunwei Liu, Weiwei Shao, Yong Tian, Yan Liu, Bin Yu, Zhedian Zhang, Yunhan Xiao****, Institute of Engineering Thermophysics, Chinese Academy of Sciences*	

WEDNESDAY, JUNE 13 — 11:15 AM - 12:45 PM

	COMBUSTION, FUELS & EMISSIONS	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	CYCLE INNOVATIONS
	Combustion Dynamics: Flame Response to Perturbations	**Data Analytics and Reasoning for Smart MRO**	**Introduction to Dynamic Analysis and Modelling of Plant Systems**
	Technical Session • A1-2 • WB-4-15	**Technical Session • Jan Mayen 1 • WB-5-04**	**Tutorial Session • Hordaland • WB-6-12**
	Session Organizer: **Jonas P. Moeck,** TUB/NTNU Session Co-Chair(s): **Mirko R. Bothien**, Ansaldo Energia Switzerland	Session Chair: **Igor Loboda**, Instituto Politecnico Nacional Session Co-Chair: **Syed Khalid**, Gas Turbine Systems Solutions, LLC	Session Organizer: **Alberto Traverso**, Univ Of Genova
11:15	GT2018:76105 **A COMPARISON OF THE TRANSFER FUNCTIONS AND FLOW FIELDS OF FLAMES WITH INCREASING SWIRL NUMBER** ***Marco Gatti, Renaud Gaudron,*** *EM2C Laboratory; CLEMENT MIRAT, ECOLE CENTRALE PARIS - CNRS -EM2C; Laurent Zimmer, Ecole centrale de Paris; Thierry Schuller, CNRS and Ecole Centrale Paris*	GT2018:75267 **Estimating Recoverable Performance Degradation Rates and Optimizing Maintenance Scheduling** ***Cody Allen, Chad Holcomb,*** *Solar Turbines Inc.;* ***Mauricio de Oliveira****, University of California San Diego*	GT2018:77352 **Introduction to Dynamic Analysis and Modelling of Plant Systems** ***Alberto Traverso****, Univ Of Genova;* ***Seyfettin Can Gulen,*** *Bechtel Infrastructure & Power Inc;* ***Alessandro Ramaglia****, Ansaldo Energia;* ***Kihyung Kim****, General Electric*
11:45	GT2018:75554 **Spray Response to Acoustic Forcing of a Multi-passage Lean-burn Aero-engine Fuel Injector** ***Jialin Su, Ashley Barker, Andrew Garmory, Jonathan F Carrotte,*** *Loughborough University*	GT2018:75286 **SELECTING OPTIMAL FEATURES FOR CROSS-FLEET ANALYSIS AND FAULT DIAGNOSIS OF INDUSTRIAL GAS TURBINES** ***Yu Zhang, Miguel Martinez-Garcia,*** *University of Lincoln;* ***Anthony Latimer****, Siemens Industrial Turbomachinery Limited*	**T U T O R I A L**
12:15	GT2018:76381 **Flame Describing Functions of a confined premixed swirled combustor with upstream and downstream forcing** ***Renaud Gaudron, Marco Gatti,*** *EM2C Laboratory;* ***CLEMENT MIRAT****, ECOLE CENTRALE PARIS - CNRS -EM2C;* ***Thierry Schuller****, CNRS and Ecole Centrale Paris*	GT2018:75540 **Intelligent Reasoning for Gas Turbine Fault Isolation and Ambiguity Resolution** ***Liang Tang, Allan Volponi****, Pratt & Whitney*	

	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	HEAT TRANSFER: NUMERICAL FILM COOLING	HEAT TRANSFER: SPECIAL SESSIONS
	Rim Seals 1	**Unsteady Film Cooling Simulation**	**Miscellaneous Heat Transfer Investigations**
	Technical Session • A1-4 + A1-5 • WB-15-05	**Technical Session • A1-6 • WB-12-05**	**Technical Session • A1-3 • WB-18-01**
	Session Organizer: **Carl Sangan**, University of Bath Session Co-Chair(s): **Jens Fridh,** KTH Royal Institute of Technology	Session Organizer: **Giovanna Barigozzi**, Università Di Bergamo Session Co-Chair(s): **Carlo Carcasci**, University of Florence	Session Organizer: **Robert Proctor**, GE Aviation Session Co-Chair(s): **Dave Flodman**, General Electric
11:15	GT2018:75116 **Advanced numerical simulation of turbine rim seal flows and consideration for RANS turbulence modelling** ***Feng Gao, John Chew,*** *University of Surrey;* ***Nicolas Poujol****, Ecole Centrale de Lyon;* ***Paul F. Beard,*** *Univeristy of Oxford*	GT2018:75440 **Effects Of Oscillations In The Main Flow On Film Cooling At Various Frequencies At A Low Blowing Ratio** ***Seung Il Baek, Savas Yavuzkurt,*** *The Pennsylvania State University*	GT2018:75151 **Drag and heat reduction mechanism of the porous opposing jet for variable blunt hypersonic vehicles** ***Shibin Li,*** *University of Defense Technology;* ***Wei Huang, zhenguo wang, Li Yan,*** *National University of Defense Technology*
11:45	GT2018:75630 **New facility setup for the investigation of cooling flow, Reynolds number and rotational effects on the interstage seal flow behavior of a gas turbine** ***Daniele Simoni, Pietro Zunino, Marina Ubaldi, Davide Lengani, Roberto Guida,*** *University of Genova*	GT2018:75695 **Numerical Investigation of Unsteady Film-cooling on the Turbine Shroud with the Blade Passing** ***Chao Gao, Cunliang Liu, Haiyong Liu, Qiling Guo, Ruidong Wang, Huiren Zhu,*** *Northwestern Polytechnical University*	GT2018:75920 **QUASI-STATIC THERMAL MODELLING OF MULTI-SCALE SLIDING CONTACT FOR UNLUBRICATED BRUSH SEAL MATERIALS** ***Qingfeng Xia, David Gillespie, Andrew Owen,*** *Oxford University;* ***Gervas Franceschini****, Rolls-Royce plc*
12:15	GT2018:75802 **A Reduced Order Model for Predicting Hot-Gas Ingestion into the Wheelspace of Gas Turbines** ***Irsha Pardeshi, Jason Liu, Tom Shih,*** *Purdue University*	GT2018:75801 **On the use of periodic boundary condition for Large Eddy Simulation of trailing edge cutback film cooling with internal ribs** ***Pierre Aillaud, Florent Duchaine, Laurent Y.M. Gicquel,*** *CERFACS;* ***Charlie Koupper****, Safran Helicopter Engines*	GT2018:76053 **INVESTIGATION INTO THE TEMPERATURE FIELD AND THERMAL DEFORMATION OF A SPIRAL BEVEL GEAR PAIR AT DIFFERENT ROTATIONAL SPEEDS** ***Shuyi Liu, Zhenxia Liu, Yaguo Lyu,*** *Northwestern Polytechnical University*

WEDNESDAY, JUNE 13 — 11:15 AM - 12:45 PM

	INDUSTRIAL & COGENERATION	MANUFACTURING MATERIALS & METALLURGY	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES
	Special Topics for Industrial and Co-Generation Systems	**Coatings for Gas Turbine Engines**	**Turbochargers - Turbines 2**
	Technical Session • Sør-Norge• WB-23-05	**Technical Session • Svalbard • WB-24-01**	**Technical Session • Oslo • WB-26-03**
	Session Organizer: **Mauro Venturini,** Universitα Degli Studi Di Ferrara Session Co-Chair(s): **Lucrezia Manservigi,** Università degli Studi di Ferrara	Session Organizer: **Jeff Smith**, MPT Session Co-Chair(s): **Tania Bhatia Kashyap**, United Technologies Research Center	Session Organizer: **Jose Ramon Serrano**, Universitat Politecnica de Valencia Session Co-Chair(s): **Lukas Benjamin Inhestern**, CMT/ Universitat Politecnica De Valencia
11:15	GT2018:75652 **An introduction into the clearance management of Ansaldo GT36 from development to validation** ***Guenter Filkorn, Sven Olmes, Stefan Boeller, Bernard Feuillard, Florent Prou, Christopher Robson, Ricardo Santos,*** *Ansaldo Energia Switzerland Ltd.*	GT2018:75045 **Effects of Phase Contents of Feedstock Powder and Methods of Thermal Shock Test on Lifetime of Thermal Barrier Coatings** ***Kwangyong Park, Byungil Yang, Insoo Kim, Kyungic Jang, Sangwon Myoung, Chanyoung Park,*** *Doosan Heavy Industries and Construction;* ***Andrea Scrivani****, H.C. Starck*	GT2018:76706 **Influence of upstream geometry on pulsatile turbocharger turbine performance** ***Shyang Maw Lim,*** *Competence Center for Gas Exchange (CCGEx), Royal Institute of Technology (KTH);* ***Anders Dahlkild****, LinnΘ FLOW Centre (FLOW), Royal Institute of Technology (KTH);* ***Mihai Mihaescu****, Competence Center for Gas Exchange (CCGEx), Royal Institute of Technology (KTH)*
11:45	GT2018:76005 **Research on Optimal Matching Method of Variable Stator Vanes for Multi - stage Compressor Based on Genetic Algorithm** ***Zhitao Wang, Kuo Fan, Wenqi Ma, Tielei Li, Shuying Li,*** *Harbin Engineering University*	GT2018:76274 **Development of ODS Coating for High Temperature Turbine Components Using DED Additive Manufacturing** ***Eric Chia, Bruce Kang,*** *West Virginia Univ;* ***Li Yang, Zheng Min, Minking Chyu****, Univ Of Pittsburgh*	GT2018:76719 **An integrated design approach for turbocharger turbines based on the performance optimization in transitory conditions** ***Matteo Checcucci, Michele Becciani, Juri Bellucci, Andrea Arnone, Alessandro Bianchini,*** *University of Florence; Nicola Pini,* ***Stephane Montesino****, Ferrari SpA;* ***Francesco Cencherle, Michele De Luca, Luca Marmorini,*** *HPE-Coxa*
12:15	GT2018:76025 **Optimization Analysis of Multistage Gas Turbine CHP Plant for Marine Applications** ***Zhitao Wang, Haoda Lei, Shuying Li, Weitian Wang****, Harbin Engineering University;* ***Yiguang Li,*** *Cranfield University*	GT2018:76412 **Influence Of Top Coat And Pre-Oxidation On The Corrosion Resistance Of Thermal Barrier Coatings In The Presence Of SO2** ***Krishna Praveen Jonnalagadda, Ru Lin Peng,*** *Linköping University;* ***Kang Yuan, Yueguang Yu, Xiaojuan Ji,*** *Beijing General Research Institute of Mining and Metallurgy;* ***Xin-Hai Li,*** *Siemens Industrial Turbomachinery AB*	GT2018:77048 **Development of a new low cost tandem VGT concept for turbocharger applications.** ***Rodrigo R. Erdmenger,*** *GE Aviation;* ***Katya Menter, Rogier Giepman, Aneesh Sridhar Vadvadgi, Thomas Lavertu,*** *GE Global Research;* ***Cathal Clancy, Dyson; Thomas Leonard,*** *IHI Charging Systems International;* ***Stephen Spence****, Queens University of Belfast*

	OIL & GAS APPLICATIONS	STEAM TURBINES	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
	Industrial Gas Turbines-An Introduction	**Design Optimization and Probabilistic Modelling**	**Fluid Film Bearings 2**
	Tutorial Session • Nord-Norge • WB-27-12	**Technical Session • Romerike • WB-29-10**	**Technical Session • E-6 • WB-34-03**
	Session Organizer: Session Co-Chair(s):	Session Organizer: **Ronald Mailach**, Technische Universitat Dresden Session Co-Chair(s): **Dirk Roos**, Niederrhein University of Applied Sciences	Session Organizer: **Kostandin Gjika**, Honeywell Transportation Systems Session Co-Chair(s): **Aurelian Fatu**, University of Poitiers, Institut Pprime
11:15	GT2018:77453 **Industrial Gas Turbines-An Introduction** ***Rainer Kurz, Mark Novaresi, Martin Habel, Bernhard Winkelmann**, Solar Turbines; **Klaus Brun**, Southwest Research Institute* **T U T O R I A L**	GT2018:75261 **Steam Turbine Exhaust Optimization Based on Gaussian Covariance Networks Using Transient CFD Simulations** ***Kevin Cremanns, Dirk Roos,** Niederrhein University of Applied Sciences; **Andreas Penkner, Simon Hecker, Christian Musch**, Siemens*	GT2018:75041 **DEGRADATION FEATURE EXTRACTION OF ROLLING BEARINGS BASED ON OPTIMAL ENSEMBLE EMPIRICAL MODE DECOMPOSITION AND IMPROVED COMPOSITE SPECTRUM ANALYSIS** ***Fengli Wang, Hua Chen**, Dalian Maritime University*
11:45		GT2018:75262 **Robust Design Optimization of a Steam Turbine Labyrinth Seal Based on Surrogate Models** ***Kevin Cremanns, Dirk Roos,** Niederrhein University of Applied Sciences; **Simon Hecker, Andreas Penkner, Christian Musch**, Siemens AG*	GT2018:75597 **TURBULENCE INPUT PARAMETERS CORRECTION METHODOLOGY IN WATER LUBRICATED THRUST BEARINGS** ***Xin Deng, Harrison Gates, Brian Weaver, Houston G. Wood, Roger Fittro,** University of Virginia*
12:15		GT2018:76595 **An optimization design platform for fir-tree root and groove for steam turbine** ***Deqi Yu,** Shanghai Electric; **Jiandao Yang, Kai Cheng, Weilin Shu,** Shanghai Turbine Works Co.,Ltd; **Kai LV,** Shanghai Electric Shanghai Turbine Works Co. Ltd; **Xiaojuan ZHANG, Ming Li**, Dalian University of Technology*	GT2018:75790 **Hydrodynamic Journal Bearings Optimization Considering Rotor Dynamics Restrictions** ***Leonid Moroz, Leonid Romanenko, Roman Kochurov, Evgen Kashtanov**, SoftInWay Inc.*

WEDNESDAY, JUNE 13 — 11:15 AM - 12:45 PM

	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: ROTORDYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Material and Structural Integrity	**Rotordynamics V - Bearing and Seal Flow 2**	**Mistuning IV**
	Technical Session • E-8 • WB-31-06	**Technical Session • Event Room • WB-33-07**	**Technical Session • E-7 • WB-35-02**
	Session Organizer: **Bjoern Buchholz**, Siemens AG Session Co-Chair(s): **Scott Keller**, Power Systems Mfg., LLC; **Martin Hughes**, Siemens Industrial Turbomachinery Ltd	Session Organizer: **Ali Gordon**, Univ Of Central Florida Session Co-Chair(s): **Feng Kai,** Hunan University	Session Organizer: **Daniele Botto**, Politecnico Di Torino Session Co-Chair(s): **Muzio M. Gola**, Politecnico di Torino, DIMEAS
11:15	GT2018:76285 **INVESTIGATION ON CREEP CHARACTERISTIC OF NICKEL-BASE SINGLE CRYSTAL ALLOY DOUBLE WALL COOLING SPECIMEN** ***Lei Li, Huan Wan, Wenjing Gao, Fujuan Tong, Shouyi Sun,*** *Northwestern Polytechnical University*	GT2018:75215 **STEADY-STATE CHARACTERISTICS OF A DUAL-ROTOR SYSTEM WITH INTERSHAFT BEARING SUBJECTED TO MASS UNBALANCE AND BASE MOTIONS** ***Xi Chen, Mingfu Liao,*** *Northwestern Polytechnical University*	GT2018:75056 **Practical Optimization of Mistuned Bladed Disk of Steam Turbine with Free-standing Blade Structure for Forced and Self-excited Vibration** ***Yasutomo Kaneko,*** *Ryukoku University;* ***Kazushi Mori****, MHI;* ***Hiroharu Ooyama****, Mhps*
11:45	GT2018:76519 **Novel test facility for investigation of the impact of thermally induced stress gradients fatigue life of cooled gas turbine components**. ***Marcus Thiele, Uwe Gampe,*** *University of Dresden;* ***Kathrin A. Fischer****, Siemens AG*	GT2018:75227 **TRANSIENT CHARACTERISTICS OF A DUAL-ROTOR SYSTEM WITH INTERSHAFT BEARING SUBJECTED TO MASS UNBALANCE AND BASE MOTIONS DURING START-UP** ***Xi Chen, Mingfu Liao,*** *Northwestern Polytechnical University*	GT2018:75223 **A REDUCED ORDER MODEL FOR NONLINEAR DYNAMICS OF MISTUNED BLADED DISKS WITH SHROUD FRICTION CONTACTS** ***S. Mehrdad Pourkiaee, Stefano Zucca,*** *Politecnico Di Torino - DIMEAS*
12:15	GT2018:75282 **Fretting Fatigue and Wear of Ti-6Al-4V with HVOF Sprayed Stellite Coating on Contact Surfaces of Shrouds and Stubs of Turbine Blades** ***Kunio Asai, Shuichi Ishizawa, Nobuhiro Isobe,*** *MHPS*		GT2018:76610 **Reduced-Order Modeling of Bladed Disks Considering Small Mistuning of the Disk Sectors** ***Lukas Schwerdt, Sebastian Willeke, Lars Panning-von Scheidt, Joerg Wallaschek,*** *Leibniz Universitat Hannover*

WEDNESDAY, JUNE 13 — 11:15 AM - 12:45 PM

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS
	Supercritical CO2 Cycle Concepts and Modeling	**Tip-Clearance Flows**	**Fan Design - 1**
	Technical Session • Akershus • WB-38-08	**Technical Session • E-4 • WB-39-07**	**Technical Session • E-3 • WB-39-18**
	Session Organizer: **Jeffrey Phillips**, Electric Power Research Institute Session Co-Chair(s): **Eric Clementoni**, Bechtel Marine Propulsion Corporation	Session Organizer: **Simon Evans**, United Technologies Research Center Session Co-Chair(s): **Mark H. Ross,** Notre Dame Turbomachinery Laboratory	Session Organizer: **William Solomon**, GE Aviation Session Co-Chair(s): **William Cousins**, United Technologies Research Center
11:15	GT2018:75196 **Evaluation of the optimal point variation of the S-CO2 cycle while considering internal pinch in recuperator** ***Seongmin Son, Jin Young Heo, Jeong Ik Lee,*** *Korea Advanced Institute of Science and Technology (KAIST)*	GT2018:76487 **Comparison of DDES and URANS for Unsteady Tip Leakage Flow in an Axial Compressor Rotor** ***Yangwei Liu, Luyang Zhong, Lipeng Lu,*** *BeiHang University*	GT2018:76640 **Aerodynamic Similarity Principles and Scaling Laws for Windmilling Fans** ***Dilip Prasad,*** *Pratt & Whitney*
11:45	GT2018:75914 **Investigation of engine waste heat recovery using supercritical CO2 (S-CO2) Cycle System** ***Jian Song, Xiaodong Ren, Chunwei Gu,*** *Tsinghua University*	GT2018:75916 **The Behavior of Casing Boundary Layer with the Presence of Tip Leakage Vortex** ***Xi Nan***, Institute of Engineering *Thermophysics, Chinese Academy of Sciences;* ***Feng Lin,*** *Idaho State University;* ***Takehiro Himeno, Toshinori Watanabe,*** *The University of Tokyo*	GT2018:76861 **Numerical and Experimental Investigation of Aerodynamic Characteristics of Model Ultra High Bypass Ratio Counter Rotating Fan** ***Iaroslav Druzhinin, Victor Mileshin, Vladimir Korzhnev,*** *Central Institute of Aviation Motors*
12:15	GT2018:77106 **Integral Techno-Economic Analysis of Supercritical Carbon Dioxide Cycles for Concentrated Solar Power** ***Francesco Crespi, David Sanchez, Tomas Sanchez,*** *University of Seville;* ***Gonzalo S. Martinez,*** *AICIA*	GT2018:77071 **On The Interactions of A Rotor Blade Tip Flow with Axial Casing Grooves in an Axial Compressor near Best Efficiency Point** ***Huang Chen, Yuanchao Li, Joseph Katz,*** *Johns Hopkins University*	GT2018:75739 **Reverse Thrust Aerodynamics of Variable Pitch Fans** ***Tim S. Williams, Cesare A. Hall,*** *Whittle Laboratory*

	TURBOMACHINERY: DEPOSITION, EROSION, FOULING, AND ICING	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	
	Multi-phase (Water/Ice) Deposition in Gas Turbines	**Radial and Mixed Flow Turbines II**	
	Technical Session • E-2 • WB-47-01	**Technical Session • E-1 • WB-44-02**	
	Session Organizer: **Alessandro Corsini,** Sapienza University of Rome Session Co-Chair(s): **Klaus Brun**, Southwest Research Institute	Session Organizer: **Jason Walkingshaw**, BorgWarner Turbo Systems Session Co-Chair(s): **Charles Stuart**, Queen's University Belfast	
11:15	GT2018:76002 **A Numerical Model for Simulating Liquid Particles Deposition on Surface** ***Zhenxia Liu, Fei Zhang, Zhengang Liu,*** *Northwestern Polytechnical University*	GT2018:75013 **Variable geometry turbine nozzle design for high expansion ratios** ***Hua Chen,*** *Marine Eng. College, Dalian Maritime University;* ***Lei Huang****, National Laboratory of Engine Turbocharging Technology*	
11:45	GT2018:75032 **Importance of Surface Curvature in Modelling Droplet Impingement on Fan Blades** ***Charles B. Burson-Thomas, Terry J. Harvey, Robert J.K. Wood,*** *University of Southampton;* ***Richard Wellman****, Rolls-Royce plc.*	GT2018:75107 **Effect of Guide Vane Thickness and Solidity on Aerodynamic Characteristic of Variable Nozzle Turbine** ***Dengfeng Yang, Ce Yang,*** *Beijing Institute of Technology;* ***Leon Hu, J.James Yi,*** *Ford Motor company*	
12:15	GT2018:76923 **Fouling on a Multistage Axial Compressor in the Presence of a Third Substance at the Particle/Surface Interface** ***Nicola Aldi, Nicola Casari, Devid Dainese, Michele Pinelli, Pier Ruggero Spina, Alessio Suman,*** *University of Ferrara;* ***Mirko Morini****, University of Parma*	GT2018:75533 **Design Point Efficiency of Radial Turbines** ***Graham Cox,*** *PCA Engineers Limited*	

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	AIRCRAFT ENGINE	CERAMICS	COAL, BIOMASS & ALTERNATIVE FUELS
	Operability	**Ceramic Matrix Composites: Tutorials**	**Environmental Life Cycle Assessment (LCA) Approach to Design, Improve and Manufacture Gas Turbine/Engines for Alternative Fuel Flexibility - Joint Session with Manufacturing Materials & Metallurgy Committee**
	Technical Session • Jan Mayen 2 • WC-1-01	**Tutorial Session • Oslo • WC-2-04 Part A**	**Panel Session • Jan Mayen 1 • WC-3-05 Part A**
	Session Organizer: **Walter Obrien**, Virginia Tech. Session Co-Chair(s): **Kevin Shepherd**, Honeywell Aerospace	Session Organizer: **Gregory Morscher**, The University of Akron Session Co-Chair(s): **Sai Sarva**, GE Global Research	Session Organizer: **Angela Serra,** BHGE Session Co-Chair(s): **Francesco Fantozzi**, University of Perugia, Dip. Ingegneria Industriale; **Ashok Koul**, Life Prediction Technologies Inc.
2:00	GT2018:75413 **Effects of Transient Heat Transfer on Compressor Stability** ***Andras Kiss, Zoltan Spakovszky,*** *Massachusetts Institute of Technology*	GT2018:77548 **Ceramic Matrix Composites: Tutorials (2:00 - 3:00 pm)** ***Doug Kiser****, NASA Glenn Research Center* GT2018:77549 **Ceramic Matrix Composites: Tutorials (3:00 - 3:30 pm)** ***Sungbo Shim****, Rolls Rocye Corporation*	GT2018:77539 **Turbine Vane Fracture in Aero Engines and its Impact on LCM** ***Ashok Koul****, Life Prediction Technologies Inc.* GT2018:77588 **Life cycle and maintenance optimization through the GT Digital Twin approach.** ***Fausto Carlevaro****, BHGE*
2:30	GT2018:75749 **Demonstration of a Remotely-Controlled Swirl Generator for Simulating Aircraft Inlet Secondary Flows During Turbine Engine Ground Tests** ***David Beale,*** *QuantiTech, Inc.*	**TUTORIAL**	**PANEL**
3:00	GT2018:76654 **High-fidelity modeling of the acceleration of a turboshaft engine during a restart** ***Antoine Ferrand,*** *Safran, Institut Pprime of ISAE-ENSMA;* ***Marc Bellenoue****,* ***Yves Bertin****, Institut Pprime of ISAE ENSMA;* ***Radu Cirligeanu****, Safran Group;* ***Patrick Marconi****,* ***Fabien Mercier-Calvairac,*** *Safran Helicopter Engines*		

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Transverse Instabilities in Gas Turbines	**Combustor Design & Development II**	**Combustion Dynamics: Modeling III**
	Panel Session • A1-2 • WC-4-36 Part A	**Technical Session • Jan Mayen 3 • WC-4-05 Part A**	**Technical Session • A1-1 • WC-4-21 Part A**
	Session Organizer: **Christian Oliver Paschereit**, H.F.I TU Berlin Session Co-Chair(s): **Tim Lieuwen**, Georgia Institute of Technology	Session Organizer:**Adnan Eroglu**, Siemens Switzerland Session Co-Chair(s): **Oliver Lammel**, German Aerospace Center (DLR)	Session Organizer: **Gilles Bourque**, Siemens Canada Session Co-Chair(s): **Jeffrey Bergthorson**, McGill University; **A John Moran**, Loughborough University; **Marc Furi**, Siemens Canada Limited
2:00	GT2018:77624 **Overview of Combustor Screech** ***Tim Liewen**, Georgia Institute of Technology* GT2018:77486 **Ansaldo Perspective** ***Mirko R. Bothien**, Ansaldo Energia Switzerland* GT2018:77583 **User/Operator Perspective** ***David Noble**, Electric Power Research Institute*	GT2018:75891 **Development of a Dry Low NOx Combustor for Dual Gaseous Fuels of Natural Gas and Petroleum Gas** ***Tomohiro Asai, Yoshinori Matsubara, Tomomi Koganezawa, Yoshitaka Hirata, Akinori Hayashi, Shohei Yoshida**, Mitsubishi Hitachi Power Systems, Ltd; **Keisuke Miura, Kazuki Abe**, Mitsubishi Heavy Industries, Ltd.*	GT2018:75146 **THERMOACOUSTIC LIMIT CYCLE PREDICTIONS OF A PRESSURISED LONGITUDINAL INDUSTRIAL GAS TURBINE COMBUSTOR** ***Yu Xia, Davide Laera, Aimee S. Morgans, W. P. Jones**, Imperial College; **Jim Rogerson**, Siemens Industrial Turbomachinery Ltd.*
2:30	**P A N E L**	GT2018:76253 **Experimental and Numerical Investigations of MILD Combustion in A Model Combustor Applied for Gas Turbine** ***Huan Zhang, Zhedian Zhang, Yan Xiong, Yan Liu, Yunhan Xiao**, Institute of Engineering Thermophysics, Chinese Academy of Sciences*	GT2018:75517 **Background Oriented Schlieren of fuel jet flapping under thermoacoustic oscillations in a sequential combustor** ***Markus Weilenmann, Yuan Xiong, Nicolas Noiray**, ETH Zurich; **Mirko R. Bothien**, Ansaldo Energia Switzerland*
3:00		GT2018:76278 **Investigation on Flow Characteristics in the Annular Combustor with Opposed Jets** ***Yongbin Ji, Bing Ge, Shusheng Zang**, Shanghai Jiao Tong University*	GT2018:75529 **Direct assessment of the Acoustic Scattering Matrix of a Turbulent Swirl Combustor by combining System Identification, Large Eddy Simulation and analytical approaches** ***Malte Merk, Camilo Silva, Wolfgang Polifke**, Technische Universitat Munchen; **Renaud Gaudron**, EM2C Laboratory; **Marco Gatti**, Laboratoire EM2C; CLEMENT MIRAT, ECOLE CENTRALE PARIS - CNRS -EM2C; **Thierry Schuller**, CNRS and Ecole Centrale Paris*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	EDUCATION	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)
	Turbomachinery / Gas Turbines Education for the 21st Century	**NGV/Blade Film Cooling**	**Shaft Seals and Lube Oil Systems**
	Panel Session • Nord-Norge • WC-7-02 Part A	**Technical Session • A1-3 • WC-19-01 Part A**	**Technical Session • A1-4 + A1-5 • WC-15-09 Part A**
	Session Organizer: **Sabri Deniz,** Lucerne University of Applied Sciences Session Co-Chair(s): **Sam Grimshaw**, University of Cambridge Whittle Laboratory	Session Organizer: **Lamyaa El-Gabry,** Princeton University Session Co-Chair(s): **Ali Ameri**, Ohio State University	Session Organizer: **Neelesh Sarawate**, GE Global Research Session Co-Chair(s): **Eric Grover,** Pratt & Whitney
2:00	GT2018:77528 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Edward Greitzer**, Massachusetts Institute Of Technology* GT2018:77531 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Damian Vogt**, University of Stuttgart* GT2018:77532 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Patricia Cargill**, GE Aviation* GT2018:77533 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Dr. Alexander V. Mirzamoghadam**, Honeywell Aerospace* GT2018:77534 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Masha Folk**, Cambridge University* **PANEL**	GT2018:75037 **INCIDENCE EFFECT ON THE AERO-THERMAL PERFORMANCE OF A FILM COOLED NOZZLE VANE CASCADE** ***Hamed Abdeh, Giovanna Barigozzi, Antonio Perdichizzi**, University of Bergamo; **Marc Henze**, **Joerg Krueckels**, Ansaldo Energia Switzerland Ltd.*	GT2018:75139 **Comparative Study of a Felt Abradable Seal** ***Dan Hasnedl, Premysl Epikaridis**, Doosan Skoda Power*
2:30		GT2018:75249 **The Effects of Combustor Cooling Features on Nozzle Guide Vane Film Cooling Experiments** ***Nicholas Holgate, Peter Ireland**, University of Oxford; **Eduardo Romero**, Rolls Royce*	GT2018:75150 **NUMERICAL INVESTIGATION ON THE LEAKAGE AND ROTORDYNAMIC CHARACTERISTICS FOR THREE TYPES OF ANNULAR GAS SEALS IN WET GAS CONDITIONS** ***ZHIGANG LI**, Xi'An Jiaotong Univerity; **Zhi FANG, Jun Li,** Institute of Turbomachinery, Xi'an Jiaotong Univ.*
3:00		GT2018:75439 **Studies on Cooling Performance of Round Cooling Holes with Various Configurations on a High-Pressure Turbine Vane** ***Ken-ichi Funazaki, Fumiya Kikuchi, Issei Tashiro,** Iwate University; **Takeomi Ideta, Yuhi Tanaka**, IHI Co.*	GT2018:75812 **A New Approach for Scaling Aspirating Face Seal Aerodynamics** ***Julius Wilhelm, Corina Schwitzke, Hans-Joerg Bauer,** Karlsruhe Institute of Technology (KIT); **Tue Nguyen**, GE Global Research*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	INDUSTRIAL & COGENERATION	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	STEAM TURBINES
	Gas Turbine Design Using Aerothermodynamic Analysis	**Turbochargers - Compressors 1**	**Steam Turbines Panel**
	Tutorial Session • Sør-Norge• WC-23-08 Part A	**Technical Session • Svalbard • WC-26-04**	**Panel Session • Romerike • WC-29-01 Part A**
	Session Organizer: **Rakesh Bhargava,** Innovative Turbomachinery Technologies Corp. Session Co-Chair(s):	Session Organizer: **Srithar Rajoo,** Univ Technology Malaysia Session Co-Chair(s): **Tom Heuer,** Borg Warner Turbo Systems Engineering Gmbh	Session Organizer: **Ivan Mcbean**, GE Session Co-Chair(s): **Markus Schatz**, University of Stuttgart
2:00	GT2018:77540 **Part A: Gas Turbine Design Using Aerothermodynamic Analysis** ***Rakesh Bhargava**, Innovative Turbomachinery Technologies Corp.*	GT2018:75033 **Aerodynamic Design of a Ported Shroud Casing Treatment for a Turbocharger Compressor of a Miller-Cycle Gasoline Engine** ***Christoph Schafer**, **Mathias Bogner**, **Jan Ehrhard**, **Matthias Dunzer**, Continental Automotive GmbH*	GT2018:77496 **Maintenance, Repair Overhaul and Upgrade of Steam Turbines** ***Klaus Helbig**, GE Germany*
2:30	**T U T O R I A L**	GT2018:75717 **Development of a Meanline Model for Preliminary Design of Recirculating Casing Treatment in Turbocharger Compressors** ***Carlos Felipe F. Favaretto**, **Mark R. Anderson**, **Shuo Li**, Concepts NREC; **Leon Hu**, Ford Motor Company*	GT2018:77497 **Maintenance, Repair Overhaul and Upgrade of Steam Turbines at Doosan Skoda Power** ***Adam Bajer**, **Stanislav Snejdar**, Doosan Škoda Power*
3:00		GT2018:75747 **PERFORMANCE OF THE AUTOMOTIVE TURBOCHARGER COMPRESSOR WITH VARIOUS CO_2-AIR MIXTURES** ***Tomasz Duda**, **Colin D Copeland**, University of Bath*	GT2018:77498 **Renovation Strategy & Application for Existing Steam Turbines at MHPS** ***Yuki Enommoto**, Mitsubishi Hitachi Power Systems, Ltd.*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: ROTORDYNAMICS
	Seals 2	**Crack Growth Modelling**	**Rotordynamics III - Experiments and Special Investigations**
	Technical Session • E-6 • WC-34-02	**Technical Session • E-8 • WC-31-01 Part A**	**Technical Session • Event Room • WC-33-03 Part A**
	Session Organizer: **Alexandrina Untaroiu**, Virginia Tech	Session Organizer: **Balkrishna Annigeri**, Pratt & Whitney Session Co-Chair(s): **Uwe Gampe**, University of Dresden; **Andrea Riva**, Ansaldo Energia; **Martin Hughes**, Siemens Industrial Turbomachinery Ltd.	Session Organizer: **Scott Yandt**, National Research Council Canada Session Co-Chair(s): **Minh Quan Pham**, Siemens Canada Limited
2:00	GT2018:75009 **Rotordynamic Characterization of Labyrinth Seals in Steam Turbines: Effects of Thermal and Mechanical Loads** ***Filippo Cangioli,*** *Waukesha Bearings;* ***Steven Chatterton, Paolo Pennacchi, Andrea Vania,*** *Politecnico di Milano;* ***Leonardo Nettis, Lorenzo Ciuchicchi, Giuseppe Vannini,*** *Baker Hughes, a GE company*	GT2018:75400 **Some Recent Advances in Engineering Fracture Modeling for Turbomachinery** ***R. Craig McClung, Yi-Der Lee, James Sobotka, Jonathan P. Moody, Vikram Bhamidipati, Michael Enright,*** *Southwest Research Inst;* ***D. Benjamin Guseman, Colin B. Thomas,*** *Elder Research Inc.*	GT2018:75443 **Investigation of Flow-induced Radial Force and Its Influence on Rotor Dynamics for a Cryogenic Liquid Turbine Expander** ***Ningbo Yuan, Jinju Sun, Peng Song, Changjiang Huo, Shan Sun,*** *Xi'an Jiaotong University*
2:30	GT2018:75072 **Rotordynamic Characterization of a Staggered Labyrinth Seal: Experimental Test Data and Comparison with Predictions** ***Filippo Cangioli,*** *Waukesha Bearings;* ***Giuseppe Vannini, Lorenzo Ciuchicchi, Leonardo Nettis,*** *Baker Hughes, a GE company;* ***Paolo Pennacchi, Steven Chatterton,*** *Politecnico di Milano*	GT2018:75716 **STRUCTURAL INTEGRITY ASSESSMENT OF ORC TURBINE TIE-RODS: AN ANALYSIS BASED ON ELASTIC SHAKEDOWN AND FRACTURE MECHANICS** ***Silvio Rabbolini, Massimiliano Sanvito, Dario Rizzi,*** *Exergy SpA;* ***Antonietta Lo Conte, Stefano Beretta,*** *Politecnico Di Milano*	GT2018:75607 **Study on Subsynchronous Vibration with Tilting Pad Journal Bearing under Starved Lubrication** ***Rimpei Kawashita, Tadasuke Nishioka, Shimpei Yokoyama, Makoto Iwasaki, Shuichi Isayama,*** *Mitsubishi Heavy Industries;* ***Yuichiro Waki,*** *Mitsubishi Hitachi Power Systems, Ltd.*
3:00	GT2018:75205 **Leakage and Dynamic Force Coefficients for Two Labyrinth Gas Seals: Teeth-on-Stator and Interlocking Configurations. A CFD approach to their Performance** ***Luis San Andres, Tingcheng Wu,*** *Texas A&M University*	GT2018:75734 **Failure Assessment of Test Coupons - Comparison Between Model Predictions - Test Results** ***Sushovan Roychowdhury, Tomas Mønsson, Thomas Hansson,*** *GKN Aerospace Sweden AB*	GT2018:75639 **INVESTIGATION OF FAN BLADES VIBRATION DUE TO BLADE/CASING RUBBING INTERACTIONS USING IN-PLANE TWO-DIMENSIONAL MODEL** ***Jiaguangyi Xiao, Yong Chen, HUA OUYANG, Anjenq Wang,*** *Shanghai Jiao Tong University*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS
	Experimental Vibration Analysis	**Heat Exchangers for Supercritical CO_2 Power Cycle Applications**	**Tandem Aerofoils**
	Technical Session • E-7 • WC-35-10 Part A	**Tutorial Session • Akershus • WC-38-12**	**Technical Session • E-2 • WC-39-08**
	Session Organizer: **Christoph W. Schwingshackl**, Imperial College London Session Co-Chair(s): **Vsevolod Kharyton**, Siemens	Session Organizer: **Grant Musgrove**, Southwest Research Institute	Session Organizer: **Michael M. Joly**, United Technologies Research Center Session Co-Chair(s): **Tom Verstraete**, Von Karman Institute for Fluid Dynamics
2:00	GT2018:76709 **Stress Calibration Methodology of Stator Blades Using Experimental SAFE Diagram** ***Jerome Ligot, Sebastien Hoffait,*** *V2i;* ***Jean de Cazenove, Frederic Vallino,*** *Safran Aero Boosters;* ***Jean-Claude Golinval,*** *University of Liege*	GT2018:77457 **Tutorial: Heat Exchangers for Supercritical CO2 Power Cycle Applications** ***Grant Musgrove,*** *Southwest Research Institute;* ***Shaun Sullivan****, Brayton Energy LLC;* ***Marc Portnoff****, Thar Energy, LLC*	GT2018:75132 **SOME ASPECTS OF TRANSONIC COMPRESSOR TANDEM DESIGN** ***Alexander Hergt, Sebastian Grund, Joachim Klinner, Wolfgang Steinert, Manfred Beversdorff,*** *German Aerospace Center (DLR);* ***Ulrich Siller****, AeroDesignWorks GmbH*
2:30	GT2018:76791 **SELECTION OF DYNAMIC TESTING MEASUREMENT LOCATIONS FOR INTEGRALLY BLADED DISKS** ***Joseph Beck,*** *Perceptive Engineering Analytics LLC;* ***Alex Kaszynski,*** *Universal Technology Corporation;* ***Jeffrey M. Brown,*** *US Air Force Research Laboratory;* ***Daniel Gillaugh,*** *AFRL/RQTI;* ***Onome Scott-Emuakpor,*** *AFRL*	**T U T O R I A L**	GT2018:75477 **Effect of Tandem Blading in Contra-rotating Axial Flow Fans** ***Manas M P, A M Pradeep,*** *Indian Institute of Technology Bombay*
3:00	GT2018:76342 **Efficient Generation of Engine Representative Tip Timing Data Based on a Reduced Order Model For Bladed Rotors** ***Felix Figaschewsky, Arnold Kuehhorn, Benjamin Hanschke****, Brandenburg University of Technology Cottbus-Senftenberg*		GT2018:75478 **Performance Evaluation of a Tandem Rotor under Design and Off-design Operation** ***Amit Kumar, A M Pradeep,*** *Indian Institute of Technology Bombay*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Preliminary Design Methods	**Manufacturing Tolerances and Uncertainties**	**Unsteady Flows in Turbines I**
	Technical Session • E-3 • WC-42-27 Part A	**Technical Session • E-4 • WC-46-02 Part A**	**Technical Session • E-1 • WC-45-02 Part A**
	Session Organizer: **Alexander Krumme**, German Aerospace Center -DLR Session Co-Chair(s): **Anton Streit**, Siemens AG	Session Organizer: **Marcus Meyer**, Rolls-Royce Deutschland Ltd & Co KG Session Co-Chair(s): **Marc Nagel**, MTU Aero Engines	Session Organizer: **David Halstead**, GE Aviation
2:00	GT2018:76214 **Numerical Study of the Effect of the Gas to Wall Temperature Ratio on the Bypass Transition Using State of the Art Transition Models** ***Riccardo Rubini**, University of Southampton; **Roberto Maffulli**, University of Oxford; **Tony Arts**, Von Karman Inst*	GT2018:76723 **Comprehensive Geometric Description of Manufacturing Scatter of High Pressure Turbine Nozzle Guide Vanes for Probabilistic CFD Analysis** ***Paul Voigt, Lars Hoegner,; Barbara Fiedler, Matthias Voigt, Ronald Mailach**, Technische Universitaet Dresden; **Marcus Meyer**, Rolls-Royce Deutschland Ltd & Co KG; **Alkin Nasuf**, GWT-TUD GmbH*	GT2018:75008 **Local and global stability analysis of an academic rotor/stator cavity and their control** ***Matthieu Queguineur, Thibault Bridel-Bertomeu, Laurent Y.M. Gicquel, Gabriel Staffelbach**, CERFACS*
2:30	GT2018:76416 **One-Dimensional Prediction and Three-Dimensional CFD Simulation of the Fluid Dynamics of Regenerative Pumps** ***Massimiliano Insinna, Simone Salvadori, Francesco Martelli**, University of Florence **Giorgio Peroni, Gilles Simon, Antonio Dipace, Raffaele Squarcini**, Pierburg Pump Technology Italy S.p.A.*	GT2018:75999 **Performance Impact of Manufacturing Tolerances for a Turbine Blade Using Second Order Sensitivities** ***Jiaqi Luo**, Peking University; **Feng Liu**, University Of California Irvine*	GT2018:75022 **LARGE-EDDY SIMULATION OF TURBINE RIM SEAL FLOW** ***Alexej Pogorelov, Matthias Meinke, Wolfgang Schroeder**, RWTH Aachen University, AIA*
3:00	GT2018:75845 **Improved Smith Chart for Axial Compressor Design** ***Mark R. Anderson**, Concepts NREC*	GT2018:75415 **Robust Optimization Design of a Single Stage Transonic Axial Compressor Considering Manufacturing Uncertainties** ***Zhihui Li**, Washington University in St. Louis; **Yanming Liu**, Beijing Institute of Technology; **Ramesh Agarwal**, Washington Univ*	GT2018:76327 **Unsteady Flow Simulation of Buoyancy-Driven Flows in High-Pressure Compressor Disk Cavities** ***Atsushi Tateishi, Toshinori Watanabe, Takehiro Himeno**, University of Tokyo*

WEDNESDAY, JUNE 13 — 2:00 - 3:30 PM

	WIND ENERGY	AIRCRAFT ENGINE	CONTROLS, DIAGNOSTICS & INSTRUMENTATION
	Wind Turbine Simulation Methods and Applications	**Operability**	**Constructing a Digital Twin (Part A)**
	Technical Session • Hordaland • WC-48-04 Part A	**Technical Session • Jan Mayen 2 • WC-1-01**	**Tutorial Session • Svalvard • WC-5-15**
	Session Organizer: **Marinos Manolesos**, Flow Field Session Co-Chair(s): **Alessandro Bianchini,** University of Florence	Session Organizer: **Walter Obrien**, Virginia Tech. Session Co-Chair: **Kevin Shepherd**, **Eric Shepard,** Honeywell Aerospace	Session Organizer: **Rusty Irving,** GE Global Research
2:00	GT2018:76554 **Implementation of the Multi-Level Multi-Integration Cluster method to the Treatment of Vortex Particle Interactions for Fast Wind Turbine Wake Simulations** ***Joseph Saverin**, TU Berlin; **Arne van Garrel,** University of Twente; **David Marten**, TU Berlin – ISTA; **George Pechlivanoglou**, **Christian Oliver** Paschereit, H.F.I TU Berlin*	GT2018:75413 **Effects of Transient Heat Transfer on Compressor Stability** ***Andras Kiss, Zoltan Spakovszky,** Massachusetts Institute of Technology*	GT2018-77631 **Digital Twin** ***Rusty Irving**, GE Global Research* **T U T O R I A L**
2:30	GT2018:76575 **Advanced Medium-Order Modelling for the Prediction of the Three-Dimensional Wake shed by a Vertical Axis Wind Turbine** ***Joseph Saverin**, TU Berlin; **Giacomo Persico**, **Vincenzo Dossena**, Politecnico Di Milano; **David Marten**, TU Berlin – ISTA; **George Pechlivanoglou**, **Christian Oliver** Paschereit, H.F.I TU Berlin*	GT2018:75749 **Demonstration of a Remotely-Controlled Swirl Generator for Simulating Aircraft Inlet Secondary Flows During Turbine Engine Ground Tests** ***David Beale**, QuantiTech, Inc.*	
3:00	GT2018:76623 **A critical analysis on low-order simulation models for Darrieus VAWTs: how much do they pertain to the real flow?** ***Alessandro Bianchini, Francesco Balduzzi, Giovanni Ferrara,** University of Florence; **Giacomo Persico**, **Vincenzo Dossena**, Politecnico Di Milano; **Lorenzo Ferrari**, University of Pisa - DESTEC*	GT2018:76654 **High-fidelity modeling of the acceleration of a turboshaft engine during a restart** ***Antoine Ferrand,** Safran / Institut Pprime of ISAE-ENSMA; **Marc Bellenoue**, **Yves Bertin**, Institut Pprime of ISAE ENSMA; **Radu Cirligeanu**, Safran Group; **Patrick Marconi**, **FabienMercier-Calvairac**, Safran Helicopter Engines*	

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

AIRCRAFT ENGINE

Operability

Technical Session • Jan Mayen 2 • WD-1-01

Session Organizer: **Walter Obrien**, Virginia Tech.
Session Co-Chair(s): **Kevin Shepherd**, Honeywell Aerospace

4:00

GT2018:77089
A Methodology for Quantifying Distortion Impacts using a Modified Parallel Compressor Theory
Manish Pokhrel, Jonathan Gladin, Elena Garcia, Dimitri Mavris, *Georgia Institute of Technology*

4:30

GT2018:75968
Impact of Turbine and Compressor Blade Stagger Angle Adjustment On the Efficiency and Performance of Gas Turbines During Off-Design and Dynamic Operation
Meinhard Schobeiri*, Texas A & M University*

5:00

CERAMICS

Ceramic Matrix Composites: Tutorials

Tutorial Session • Oslo • WD-2-04 Part B

Session Organizer: **Gregory Morscher,** The University of Akron
Session Co-Chair(s): **Sai Sarva**, GE Global Research

GT2018:77550
Ceramic Matrix Composites: Tutorials (4:00 - 4:30 pm)
Sungbo Shim*, Rolls Rocye Corporation*

GT2018:77551
Ceramic Matrix Composites: Tutorials (4:30 - 5:30 pm)
Bryan Harder*, NASA Glenn Research Center*

GT2018:77459
Ceramic Matrix Composites (CMCs) and Environmental Barrier Coatings (EBCs): History, Processing and Properties
Bryan Harder, Doug Kiser, *NASA Glenn Research Center*

TUTORIAL

COAL, BIOMASS & ALTERNATIVE FUELS

Environmental Life Cycle Assessment (LCA) Approach to Design, Improve and Manufacture Gas Turbine/Engines for Alternative Fuel Flexibility - Joint Session with Manufacturing Materials & Metallurgy Committee

Panel Session • Jan Mayen 1 • WD-3-05 Part B

Session Organizer: **Angela Serra,** BHGE
Session Co-Chair(s): **Francesco Fantozzi,** University of Perugia; **Ashok Koul**, Life Prediction Technologies Inc

GT2018:77575
Environmental LCA of Gas Turbine High Pressure Nozzle
Gianluca Maggiani*, Baker Huges, a GE Company*

GT2018:77509
LCA of small and micro turbine based biomass power plants
Pietro Bartocci*, Perugia University*

PANEL

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Transverse Instabilities in Gas Turbines	**Combustor Design & Development II**	**Combustion Dynamics: Modeling III**
	Panel Session • A1-2 • WD-4-36 Part B	**Technical Session • Jan Mayen 3 • WD-4-05 Part B**	**Technical Session • A1-1 • WD-4-21 Part B**
	Session Chair: **Christian Oliver Paschereit,** H.F.I TU Berlin Session Co-Chair: **Tim Lieuwen**, Georgia Institute of Technology	Session Organizer: **Adnan Eroglu,** Siemens Switzerland Session Co-Chair(s): **Oliver Lammel,** German Aerospace Center (DLR)	Session Organizer: **A John Moran,** Loughborough University Session Co-Chair(s): **Marc Furi, Gilles Bourque,** Siemens Canada; **Jeffrey Bergthorson**, McGill University
4:00	GT2018:77625 **General Electric Perspective** ***Bruno Schuermans,*** *Georgia Institute of Technology*	GT2018:76670 **Experimental and Numerical Investigations of Novel Natural Gas Low NOx Burners for Heavy Duty Gas Turbine** ***Matteo Cerutti, Giovanni Riccio,*** *Baker Hughes, a GE company;* ***Antonio Andreini, Riccardo Becchi, Bruno Facchini, Alessio Picchi,*** *University of Florence*	GT2018:76436 **Flow inhomogeneities in a realistic aeronautical gas-turbine combustor: formation, evolution and indirect noise** ***Andrea Giusti, Luca Magri,*** *University of Cambridge; Marco Zedda, Rolls-Royce plc*
4:30	**P A N E L**	GT2018:77248 **Operational Flexibility of GE's F-Class Gas Turbines with the DLN2.6+ Combustion System** ***William D. York, Derrick W. Simons, Yongqiang Fu,*** *GE Power*	GT2018:75799 **Thermoacoustics of can-annular combustors** ***Giulio Ghirardo, Mirko R. Bothien, Carlo Di Giovine,*** *Ansaldo Energia Switzerland;* ***Jonas P. Moeck,*** *TUB/NTNU*
5:00		GT2018:75701 **Experimental Study on Low Load Operation Range Extension by Autothermal On-Board Syngas Generation** ***Max H. Baumgaertner, Thomas Sattelmayer,*** *Technical Univ Munich*	

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

	EDUCATION	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)
	Turbomachinery / Gas Turbines Education for the 21st Century	**NGV/Blade Film Cooling**	**Shaft Seals and Lube Oil Systems**
	Panel Session • Nord-Norge • WD-7-02 Part B	**Technical Session • A1-3 • WD-19-01 Part B**	**Technical Session • A1-4 + A1-5 • WD-15-09 Part B**
	Session Organizer: **Sam Grimshaw**, University of Cambridge Whittle Laboratory Session Co-Chair(s): **Sabri Deniz**, Lucerne University of Applied Sciences	Session Organizer**: Lamyaa El-Gabry**, Princeton University Session Co-Chair(s): **Ali Ameri**, Ohio State University	Session Organizer: **Neelesh Sarawate**, GE Global Research Session Co-Chair(s): **J. Axel Glahn,** Pratt & Whitney, Aero Thermal Systems
4:00	GT2018:77535 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Robert Miller,*** *University of Cambridge* GT2018:77536 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Nicole Key****, Purdue Univ* GT2018:77537 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Dr. Yuan Dong,*** *Pratt and Whitney* GT2018:77538 **Turbomachinery / Gas Turbines Education for the 21st Century** ***Dr. Steven Wellborn,*** *Rolls Royce*	GT2018:76088 **AN EXPERIMENTAL INVESTIGATION OF FULL-COVERAGE FILM COOLING CHARACTERISTICS OF A TURBINE GUIDE VANE** ***Jin Wu, Li ZHANG, Lijian Cheng, Ru Jiang, Zhong-Yi Fu, Huiren Zhu,*** *Northwestern Polytechnical University*	GT2018:76161 **Film-stiffness characterization for supercritical CO2 film-riding seals** ***Deepak Trivedi, Chris Wolfe,*** *GE Global Research;* ***Rahul A. Bidkar,*** *General Electric;* ***Xiaoqing Zheng****, GE Power*
4:30	**PANEL**	GT2018:76637 **Adiabatic Effectiveness on High Pressure Turbine Nozzle Guide Vanes under Realistic Swirling Conditions** ***Tommaso Bacci, Riccardo Becchi, Alessio Picchi, Bruno Facchini,*** *University of Florence*	GT2018:76823 **Windage Losses Of A Meshing Gear Pair Measured At Different Working Conditions** ***Daniele Massini, Tommaso Fondelli, Bruno Facchini,*** *University of Florence;* ***Lorenzo Tarchi****, Ergon Research;* ***Federico Leonardi****, Ge Avio Srl*
5:00		GT2018:77099 **Sweeping Jet Film Cooling on a Turbine Vane** ***Mohammad Arif Hossain, Lucas Agricola, Ali Ameri, James Gregory, Jeffrey Bons,*** *Ohio State University*	GT2018:77141 **Three-Dimensional CFD Analysis of Meshing Losses in a Spur Gear Pair** ***Tommaso Fondelli, Daniele Massini, Antonio Andreini, Bruno Facchini,*** *University of Florence;* ***Federico Leonardi****, Ge Avio Srl*

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

	INDUSTRIAL & COGENERATION	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	STEAM TURBINES
	Gas Turbine Design Using Aerothermodynamic Analysis	**Turbochargers - Compressors 2**	**Steam Turbines Panel**
	Tutorial Session • Sør-Norge• WD-23-08 Part B	**Technical Session • Svalbard • WD-26-05**	**Panel Session • Romerike • WD-29-01 Part B**
	Session Organizer: **Rakesh Bhargava,** Innovative Turbomachinery Technologies Corp. Session Co-Chair(s):	Session Organizer: **Colin Copeland,** University of Bath Session Co-Chair(s): **Jose Ramon Serrano,** Universitat Politecnica de Valencia; **Lukas Benjamin Inhestern**, CMT/ Universitat Politecnica De Valencia	Session Organizer: **Ivan Mcbean**, GE Session Co-Chair(s): **Markus Schatz**, University of Stuttgart
4:00	GT2018:77541 **Part B: Gas Turbine Design Using Aerothermodynamic Analysis** ***Rakesh Bhargava**, Innovative Turbomachinery Technologies Corp.* **T U T O R I A L**	GT2018:76321 **A Study on the Influence of Intake Geometry on the Turbocharger Compressor Performance.** ***Dhinagaran Ramachandran, Sreenivasa S, Balamurugan Mayandi, Ranganathan RS, Saravanan Boolingam, Gurusankar A**, Turbo Energy Pvt. Ltd.*	GT2018:77507 **Maintenance, Repair Overhaul and Upgrade of Steam Turbines at Shanghai-Turbine-Works** ***Jing Zou**, Shanghai-Turbine* GT2018:77508 **Maintenance, Repair Overhaul and Upgrade of Steam Turbines at Siemens** ***Henning Almstedt**, Siemens AG* **P A N E L**
4:30		GT2018:76694 **An investigation on the loss generation mechanisms inside different centrifugal compressor volutes for turbochargers** ***Andrea Tanganelli, Francesco Balduzzi, Alessandro Bianchini, University of Florence; Giovanni Ferrara,** University of Florence; **Francesco Cencherle**, **Michele De Luca, Luca Marmorini,** HPE-Coxa*	
5:00		GT2018:76165 **On the Stability Influence of Trimmed Vaneless Diffusers in Turbocharger Applications** ***Valeriu Dragan, Mihai Mihaescu,** Swedish Royal Institute for Technology KTH*	

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: ROTORDYNAMICS
	Fluid Film Bearings 3	**Crack Growth Modelling**	**Rotordynamics III - Experiments and Special Investigations**
	Technical Session • E-6 • WD-34-10	**Technical Session • E-8 • WD-31-01 Part B**	**Technical Session • Event Room • WD-33-03 Part B**
	Session Organizer: **Adolfo Delgado**, Texas A&M University Session Co-Chair(s): **Min Zhang**, Texas A&M University	Session Organizer: **Balkrishna Annigeri**, Pratt & Whitney Session Co-Chair(s): **Uwe Gampe**, University of Dresden; **Andrea Riva**, Ansaldo Energia; **Martin Hughes,** Siemens Industrial Turbomachinery Ltd.	Session Organizer: **Scott Yandt**, National Research Council Canada Session Co-Chair(s): **Minh Quan Pham**, Siemens Canada Limited
4:00	GT2018:75659 **Theoretical and experimental analyses of directly lubricated tilting-pad journal bearings with leading edge groove** ***Thomas Hagemann, Hubert Schwarze,*** *Technical University of Clausthal*	GT2018:76465 **Durability and damage tolerance assessment of additive manufactured compressor disk considering material defects distribution** ***Jier Wang, Dianyin Hu, Long Zhang, Xi Liu, Rongqiao Wang,*** *Beihang University*	GT2018:76262 **Extensive experimental study on the stability of rotor system with spline coupling** ***Zezeng Dai, Jianping Jing, Jiqing Cong, Changmin Chen****, Shanghai Jiao Tong University*
4:30	GT2018:75662 **Potentials and Limitations of an extended Approximation Method for Nonlinear Dynamic Journal and Thrust Bearing Forces** ***Daniel Vetter, Thomas Hagemann, Hubert Schwarze,*** *Technical University of Clausthal*	GT2018:76968 **LCF initiated-HCF Propagated Crack Propagation Study** ***Amit Paspulati, Krishna Veluru, Rohit Khattar, Kashinath Akki, Sudeep Bosu, Santosh Narasimhachary,*** *Siemens Energy Inc*	GT2018:76698 **Rotordynamics Experimental Validation of a Sliding-Blade Architecture for Inside-Out Ceramic Turbines** ***Cederick Landry, Benoit Picard, Thomas Parent-Simard, Jean-Sebastien Plante, Mathieu Picard,*** *Universite De Sherbrooke*
5:00	GT2018:77151 **A Thermoelastohydrodynamic Analysis for the Static Performance of High Speed - Heavy Load Tilting-Pad Journal Bearing Operating in the Turbulent Flow Regime and Comparisons to Test Data** ***Hirotoshi Arihara, Yuki Kameyama, Yoshitaka Baba****, KOBE STEEL, LTD;* ***Luis San Andres****, Texas A&M*	GT2018:77059 **Temperature Dependence for Crack Growth under LCF for different alloys** ***Silvio Rabbolini****, Exergy SpA;* ***Stefano Foletti, Stefano Beretta,*** *Politecnico Di Milano*	GT2018:75933 **Investigation on the modal characteristics of the rubbing rotor system with additional constraint** ***Jie Hong, Pingchao Yu, Dayi Zhang, Yanhong Ma, Jixing Liu,*** *Beihang University*

	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS
	Experimental Vibration Analysis	**Supercritical CO2 Heat Exchangers**	**Casing Treatment**
	Technical Session • E-7 • WD-35-10 Part B	**Technical Session • Akershus • WD-38-03**	**Technical Session • E-2 • WD-39-14**
	Session Organizer: **Christoph W. Schwingshackl**, Imperial College London Session Co-Chair(s): **Vsevolod Kharyton**, Siemens	Session Organizer: **Grant Musgrove**, Southwest Research Institute	Session Organizer: **Anton Streit**, Siemens AG Session Co-Chair(s): **Lisa Brilliant**, UTC/ Pratt & Whitney
4:00	GT2018:75488 **The Determination of Steady-State Movements Using Blade Tip Timing Data** ***Mohamed Mohamed, Philip Bonello**, University of Manchester; **Peter Russhard**, EMTD Ltd*	GT2018:76975 **Thermal Analysis and Pressure Loss Modeling for an Optimized Heat Exchanger Used in a Recuperated CO2 Power Cycle** ***Husam Zawati, Michael Elmore, Narasimha Nagaiah, Jayanta Kapat**, University of Central Florida*	GT2018:75040 **THE INNER WORKINGS OF AXIAL CASING GROOVES IN A ONE AND A HALF STAGE AXIAL COMPRESSOR WITH A LARGE ROTOR TIP GAP: CHANGES IN STALL MARGIN AND EFFICIENCY** ***Chunill Hah**, NASA Glenn*
4:30	GT2018:75010 **Vibration Analysis from Simulated Tip Timing Sensor Signal Shape Modulation** ***Daniel Heller, Christoph W. Schwingshackl**, Imperial College London; **Ibrahim Sever**, Rolls-Royce plc.*	GT2018:77197 **Microchannel Heat Exchanger Flow Validation Study** ***Blake Lance**, **Matthew Carlson**, Sandia National Labs*	GT2018:76894 **Numerical and Experimental Research of the Circumferential Grooves Casing Treatment Influence on Characteristics of the High-Loaded Compressor First Stage** ***Vladislav Zhdanov**, **Victor Mileshin**, **Alexander Petrovitchev**, Central Institute of Aviation Motors*
5:00	GT2018:76264 **Comparison of Blade Tip Timing with Strain Gauge Data for Evaluation of Dynamic Characterization of Last Stage Blade with Interlocked Shroud for Steam Turbine** ***Jiamin Zhang, Peng Shan**, Shanghai Electric Power Generation Equipment Co.,Ltd. Turbine Plant; **Kai Cheng**, Shanghai Turbine Works Co., Ltd; **DeChao Ye**, Tianjin University*		GT2018:77203 **PERFORMANCE DESENSITIZATION FOR A HIGH-SPEED AXIAL COMPRESSOR** ***Yassine Souleimani, Huu Duc Vo**, Ecole Polytechnique de Montreal **Hong Yu**, Pratt & Whitney Canada*

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Preliminary Design Methods	**Manufacturing Tolerances and Uncertainties**	**Unsteady Flows in Turbines I**
	Technical Session • E-3 • WD-42-27 Part B	**Technical Session • E-4 • WD-46-02 Part B**	**Technical Session • E-1 • WD-45-02 Part B**
	Session Organizer: **Alexander Krumme**, German Aerospace Center -DLR Session Co-Chair(s): **Anton Streit**, Siemens AG	Session Organizer: **Marcus Meyer**, Rolls-Royce Deutschland Ltd & Co KG Session Co-Chair(s): **Marc Nagel**, MTU Aero Engines	Session Organizer: **David Halstead**, GE Aviation
4:00	GT2018:75394 **Through-flow Modelling of Single- and Two-Shaft Gas Turbines at Wide Operating Range** ***Alexander Wiedermann,*** *Man Diesel & Turbo SE;* ***Milan Petrovic****, University of Belgrade*	GT2018:77280 **Exploring the impact of manufacturing geometric uncertainties on the aerodynamic performance of a small scale compressor** ***Kailash Manohara Selvan, Lukasz Kowalczyk,*** *Dyson Ltd*	GT2018:76735 **Effects of Downstream Vane Bowing and Asymmetry on Unsteadiness in a Transonic Turbine** ***John Clark, Richard Anthony, Michael Ooten, John M. Finnegan****, AFRL/RQTT;* ***P. Dean Johnson,*** *FTT America;* ***Ron-Ho Ni****, AeroDynamic Solutions*
4:30	GT2018:75410 **Development of Method and Computer Program for Multistage Axial Compressor Design: Part I - Mean Line Design and Example Cases** ***Milan Banjac, Milan Petrovic,*** *University of Belgrade*	GT2018:75761 **Robust Fluid Topology Optimization Using Polynomial Chaos Expansions: TOffee** ***Audrey Gaymann, Francesco Montomoli, Marco Pietropaoli,*** *Imperial College London*	GT2018:77237 **Delayed Detached Eddy Simulation of a Full 3-dimensional High-Pressure Turbine Stage, Part I: Flow Topology** ***Dun Lin, Xiutao Bian, Xinrong Su, Xin Yuan,*** *Tsinghua University*
5:00	GT2018:75412 **Development of Method and Computer Program for Multistage Axial Compressor Design: Part II - Two-Dimensional Design And Validation Using CFD** ***Milan Banjac, Milan Petrovic,*** *University of Belgrade*	GT2018:77081 **Additive manufacturing of honeycombs seals in gas turbine applications** ***Ole Geisen, Lisa Kersting****, Siemens AG;* ***Lukas Masseling, Jan Bogner, Johannes Henrich Schleifenbaum,*** *RWTH Aachen University*	GT2018:75724 **On the Identification and Decomposition of the Unsteady Losses in a Turbine Cascade** ***Davide Lengani, Daniele Simoni,*** *University of Genova;* ***Richard Pichler, Richard Sandberg****, The University of Melbourne;* ***Vittorio Michelassi****, Baker Hughes GE;* ***Francesco Bertini****, Avio Aero*

WEDNESDAY, JUNE 13 — 4:00 - 5:30 PM

	WIND ENERGY	AIRCRAFT ENGINE	CONTROLS, DIAGNOSTICS & INSTRUMENTATION
	Wind Turbine Simulation Methods and Applications	**Operability**	**Constructing a Digital Twin (Part B)**
	Technical Session • Hordaland • WD-48-04 Part B	**Technical Session • Jan Mayen 2 • WD-1-01**	**Tutorial Session • Svalvard • WD-5-16**
	Session Organizer: **Alessandro Bianchini,** University of Florence Session Co-Chair(s): **Marinos Manolesos**, Flow Field	Session Organizer: **Walter Obrien**, Virginia Tech. Session Co-Chair: **Kevin Shepherd**, Honeywell Aerospace	Session Organizer: **Rusty Irving**, GE Global Research
4:00	GT2018:75217 **ON THE APPLICATION OF THE BAY MODEL FOR VORTEX GENERATOR FLOWS** ***Marinos Manolesos**, Flow Field; **Giorgos Papadakis**, **Spyros Voutsinas**, NTUA*	GT2018:77089 **A Methodology for Quantifying Distortion Impacts using a Modified Parallel Compressor Theory** ***Manish Pokhrel**, **Jonathan Gladin**, **Elena Garcia**, **Dimitri Mavris**, Georgia Institute of Technology*	GT2018-77632 **Digital Twin (Part A)** ***Rusty Irving**, GE Global Research*
4:30	GT2018:75405 **Investigating efficient clusters of Savonius wind turbines** ***Ahmed Ibrahim**, **Ahmed El Baz**, British University In Egypt (BUE)*	GT2018:75968 **Impact of Turbine and Compressor Blade Stagger Angle Adjustment On the Efficiency and Performance of Gas Turbines During Off-Design and Dynamic Operation** ***Meinhard Schobeiri**, Texas A & M University*	
5:00	GT2018:76016 **Dynamic modelling of blades based on a novel Curved Thin Walled Beam theory** ***Juan Jauregui**, UNIVERSIDAD AUTONOMA DE QUERETARO; **Diego Cardenas**, **Oliver Probst**, ITESM; **Hugo Elizalde**, ITESM Campus Ciudad De Mexico*		

WEDNESDAY, JUNE 13		4:00 - 5:30 PM
4:00		
4:30		
5:00		

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	AIRCRAFT ENGINE	CERAMICS	COAL, BIOMASS & ALTERNATIVE FUELS
	Whole Engine Performance and Novel Concepts	**Ceramic Matrix Composites: Testing and Modeling - I**	**The Challenges of Combustion Computational Fluid Dynamics for Industrial Gas Turbine Engines**
	Technical Session • Jan Mayen 2 • ThA-1-06	**Technical Session • Oslo • ThA-2-01**	**Tutorial Session • Sør-Norge• ThA-3-06**
	Session Organizer: **Oscar Kogenhop**, Netherlands Aerospace Centre - NLR Session Co-Chair(s): **Eric Shepard**, Honeywell	Session Organizer: **Jun Shi**, Rolls-Royce Corporation Session Co-Chair(s): **Rajesh Kumar**, United Technologies Research Ctr	Session Organizer: **Pierre Gauthier**, Siemens Energy Canada
8:00	GT2018:75501 **Dual Drive Booster for a Two-Spool Turbofan: High Shaft Power Offtake Capability for MEA and Hybrid Aircraft Concepts** ***Vadim Kloos, Peter Franz Jeschke,*** *RWTH Aachen University;* ***Trevor H Speak, Robert J Sellick,*** *Derwent Aviation Consulting Ltd*	GT2018:75051 **Fatigue of Advanced SiC/SiC Ceramic Matrix Composites at Elevated Temperature in Air and in Steam** ***Marina Ruggles-Wrenn, Nicholas Boucher****, Air Force Institute of Technology;* ***Craig Przybyla****, Air Force Research Laboratories*	GT2018:77460 **The Challenges of Combustion Computational Fluid Dynamics for Industrial Gas Turbine Engines** ***Pierre Gauthier,*** *Siemens Energy Canada;* ***Daniel Lorstad****, Siemens Industrial Turbomachinery*
8:30	GT2018:75637 **Evaluation of the Fuel Saving Potential Regarding Recuperated Helicopter Flight Conditions** ***Chengyu Zhang, Martin Kerler, Volker Guemmer****, Technical University of Munich*	GT2018:75791 **Detection of strain distribution in SiCf/SiC mechanical test coupons** ***Christopher D. Newton, J. Paul Jones,*** *Institute of Structural Materials;* ***Louise Gale****, Rolls-Royce plc;* ***Martin R. Bache****, Swansea University*	
9:00	GT2018:76121 **Thermodynamic Analysis on Optimum Pressure Ratio Split of Intercooled Recuperated Turbofan Engines** ***Hualei Li, Zhiyong Tan****, AECC Commercial Aircraft Engine Co.,Ltd.*	GT2018:75795 **In situ assessment of fracture in SiCf/SiC under computed X-ray tomography** ***Martin R. Bache****, Swansea University;* ***P.I. Nicholson, Eleri Williams,*** *TWI Technology Centre Wales*	
9:30	GT2018:76356 **Thermal management system for the MEE and engine embedded electric machine** ***Noriko Morioka, Hitoshi Oyori, Seki Naoki, Tsuyoshi Fukuda, Fuminori Suzuki****, IHI Corporation*	GT2018:75827 **Erosion in Gas-Turbine Grade Ceramic Matrix Composites (CMCs)** ***Sung Choi, Nesredin Kedir, Cajer Gong, Luis J. Sanchez, D. Calvin Faucett, Sean Kane,*** *Naval Air Systems Command;* ***Michael J. Presby,*** *NAVAIR*	

T U T O R I A L

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	CONTROLS, DIAGNOSTICS & INSTRUMENTATION
	Pressure Gain Combustion for Gas Turbines	**High Hydrogen Combustion I**	**Advanced Controls for Gas Turbines**
	Tutorial Session • Jan Mayen 3 • ThA-4-41	**Technical Session • A1-1 • ThA-4-10**	**Technical Session • Event Room • ThA-5-07**
	Session Organizer: **Dan Paxson**, NASA Glenn	Session Organizer: **Sebastien Ducruix**, Laboratoire EM2C, CNRS, Centralesupelec, Universite Paris-Saclay Session Co-Chair(s): **Jenny Larfeldt**, Siemens Industrial Turbomachinery AB	Session Organizer: **Craig Davison**, National Research Council Canada Session Co-Chair(s): **Peter Loftus**, Rolls Royce; **Jeffrey Simmons**, Pratt & Whitney
8:00	GT2018:77552 **Pressure Gain Combustion for Gas Turbines** ***Dan Paxson**, NASA Glenn* **T U T O R I A L**	GT2018:76586 **A detailed analytical study of hydrogen reaction in a novel micromix combustion system** ***Ramzi Ben Abdallah, Vishal Sethi, Pierre Gauthier, Andrew Rolt, David Abbott**, Cranfield University*	GT2018:75847 **Linear Grey-Box Modeling of Gas Turbines Engines for MIMO Control Design** ***Robert Moroto**, Solar Turbines; **Robert R Bitmead, Amit Pandey**, University of California, San Diego*
8:30		GT2018:75553 **Improvement of premixed gas turbine combustion system fuel flexibility with increased hydrogen consumption in a renewable market place** ***Timothy Bullard, Alexander Steinbrenner, Peter Stuttaford,** Power Systems Mfg; **Dennis Jansen, Theo de Bruijne**, AES ELSTA*	GT2018:75860 **MODEL PREDICTIVE CONTROL FOR GAS TURBINE ENGINES** ***Amit Pandey, Mauricio de Oliveira,** University of California San Diego; **Robert Moroto**, Solar Turbines*
9:00		GT2018:76249 **FUEL INTERCHANGEABILITY EFFECTS ON THE LEAN BLOWOUT FOR A LEAN PREMIXED SWIRL STABILIZED FUEL NOZZLE** ***Siddhartha Gadiraju, Suhyeon Park, Prashant Singh,** Virginia Tech; **Srinath Ekkad,** North Carolina State University; **Jaideep Pandit**, Virginia Polytechnic Institute & State University; **Federico Liberatore, Ram Srinivasan, Yin-hsiang Ho**, Solar Turbines*	GT2018:75353 **AN EFFICIENT TRANSIENT SIMULATION METHOD FOR A VOLUME DYNAMICS MODEL** ***Masahiro Kurosaki, Minoru Sasamoto**, Cell-Tech KENTARO ASAKA, **Keiko Nakamura**, **Daiki Kakiuchi**, IHI*
9:30		GT2018:76434 **LES of hydrogen enriched methane/air combustion in the SGT-800 burner at engine conditions** ***Daniel Moell, Daniel Lorstad,** Siemens Industrial Turbomachinery; **XUE-SONG BAI,** Lund University*	GT2018:77236 **LPV Based Sliding Mode Control For Limit Protection Of Aircraft Engines** ***Shubo Yang, Xi Wang,** Beihang University*

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	CYCLE INNOVATIONS	EDUCATION	HEAT TRANSFER: EXPERIMENTAL FILM COOLING
	Novel Cycles and Concentrated Solar Power	**LED-based Absorption Sensors for Early Fire and Hazardous Gases Detection for Flight Vehicles and Propulsion Engines**	**Hole Geometry Effects II**
	Technical Session • Hordaland • ThA-6-10	**Tutorial Session • Jan Mayen 1 • ThA-7-03**	**Technical Session • A1-6 • ThA-19-04**
	Session Organizer: **Valentina Zaccaria,** Malardalen University Session Co-Chair(s): **Majed Sammak**, Lund University; **David Sanchez**, University of Seville	Session Organizer: **Sabri Deniz**, Lucerne University of Applied Sciences	Session Organizer: **Seth Lawson**, US Department of Energy Session Co-Chair(s): **Forrest Ames**, Univ Of North Dakota
8:00	GT2018:76218 **Performance of a semi-closed oxy-fuel combustion combined cycle with an air separation unit** ***Majed Sammak, Marcus Thern, Magnus Genrup,*** *Lund University*	GT2018:77581 **LED-based Absorption Sensors for Early Fire and Hazardous Gases Detection for Flight Vehicles and Propulsion Engines** ***Subith Vasu,*** *University of Central Florida*	GT2018:75726 **Cooling Effectiveness for a Shaped Film Cooling Hole at a Range of Compound Angles** ***Shane Haydt, Stephen Lynch,*** *Penn State University*
8:30	GT2018:76778 **Investigation and Assessment of the Performance of Various Recuperative Cycles Based on the Intercooled Recuperation Concept** ***Christina Salpingidou, Zinon Vlahostergios, Kyros Yakinthos,*** *Aristolte University of Thessaloniki;* ***Dimitrios Misirlis,*** *TEI of Central Macedonia;* ***Michael Flouros, Fabian Donus,*** *MTU Aero Engines*	**T U T O R I A L**	GT2018:75728 **Flowfield of a Shaped Film Cooling Hole Over a Range of Compound Angles** ***Shane Haydt, Stephen Lynch,*** *Penn State University*
9:00	GT2018:76370 **Rotor over-speed analysis of a hybrid-solar gas turbine** ***Darsini Kathirgamanathan, Lars-Uno Axelsson,*** *OPRA Turbines International B.V.*		GT2018:76061 **Investigation on the Leading Edge Film Cooling of Counter-Inclined Cylindrical and Laid-Back Holes with and without Impingement: Part I Film Cooling Effectiveness** ***Qiling Guo, Cunliang Liu, Huiren Zhu, Haiyong Liu, Ruidong Wang, Chao Gao,*** *Northwestern Polytechnical University*
9:30	GT2018:77090 **A Detailed Techno-Economic Analysis of Gas Turbines Applied to CSP Power Plants with Central Receiver** ***Manuel Martin,*** *Abengoa;* ***David Sanchez,*** *University of Seville*		GT2018:76066 **Investigation on the Leading Edge Film Cooling of Counter-Inclined Cylindrical and Laid-Back Holes with and without Impingement: Part II Heat Transfer Coefficient** ***Ruidong Wang, Cunliang Liu, Haiyong Liu, Huiren Zhu, Qiling Guo, Chao Gao,*** *Northwestern Polytechnical University*

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	HEAT TRANSFER: NUMERICAL FILM COOLING	HEAT TRANSFER: NUMERICAL INTERNAL COOLING
	Air System Components	**Numerical Simulation of Vane Endwall & Blade Tip Film Cooling**	**Innovative Models & New Concepts**
	Technical Session • A1-2 • ThA-15-02	**Technical Session • A1-3 • ThA-12-03**	**Technical Session • A1-4 + A1-5 • ThA-11-04**
	Session Organizer: **Robert Krewinkel**, MAN Diesel & Turbo SE Session Co-Chair(s): **Raymond Chupp**, REC Consulting	Session Organizer: **Sergio Lavagnoli**, von Karman Institute for Fluid Dynamics Session Co-Chair(s): **Okey Kwon**, AADC	Session Organizer: **Atul Kohli**, Pratt & Whitney Session Co-Chair(s): **Thomas Dyson**, GE Global Research
8:00	GT2018:76313 **Numerical Analysis of Industrial Gas Turbine Secondary Air Systems Employing Vortex Reducers** ***Thierry Sibilli, Alberto Mucci, Foster Kwame Kholi,*** *Pusan National University;* ***Geonhwan Cho****, DOOSAN*	GT2018:75255 **Numerical Investigation on the Differences between Temperature Ratio and Density Ratio in Film-cooled Endwall** ***Ran Yao,*** *University of Science and Technology of China;* ***Jianhua Wang****, University of Science & Technology;* ***Ming Wang, Wei Song****, Aero-engine Institute of Aviation Industry Corporation of China*	GT2018:75221 **Shape Optimization of Partly Removed Straight Ribs in Turbine Internal Rectangular Cooling Channel with 45-degree Ribs** ***Jiangnan Zhu, Xiying Wang, Changxian Zhang, Hui Miao,*** *Aero Engine Academy of China*
8:30	GT2018:76875 **The Effect of Manufacturing Tolerances on the Performance of Gas Turbine Air System Metering Orifices with Chamfered Inlets** ***Polina Chernukha, Adrian Spencer, James Colwill,*** *Loughborough University*	GT2018:75915 **Numerical Study of Blade Tip Cooling at High Speed Condition with Tip and Pressure-Side Coolant Injections** ***Zhou Zhihua, Songtao Wang, Chen Shaowen,*** *Harbin Institute of Technology*	GT2018:76625 **Study on Cooling Characteristics of an Internal Cooling Structure for Gas Turbine Blade with a Sloping Sheet** ***Xiangyu Wang, Kun Xiao, Zhenping Feng,*** *Xi'An Jiaotong University*
9:00	GT2018:75158 **Rotating annulus component performance characterisation based on CFD analyses** ***YOUMING YUAN, DAVID HUNT****, MENTOR GRAPHICS, SIEMENS*	GT2018:76316 **Numerical Investigation of the Cooling Performance on the Endwall With and Without Fillet** ***Qingzong Xu, Qiang Du, WANG Pei, Guang Liu, LIU Jun****, Institute of Engineering Thermophysics, Chinese Academy of Sciences*	GT2018:76093 **Effect of Buoyancy and Density Ratio on Heat Transfer in a Smooth Cooling Channel of a Gas Turbine Blade** ***Ryo Amano, Saman Beyhaghi, Mandana Saravani,*** *University of Wisconsin-Milwaukee*
9:30		GT2018:76899 **Aero-Thermal Performance of a Rotor Blade Cascade with Film Cooling in passage** ***jinglun Fu,*** *Institute of Engineering Thermophsics, Chinese Academy of Sciences;;* ***Jahed Hossain, Jayanta Kapat,*** *University of Central Florida;* ***Srikrishna Mahadevan****, Florida State University*	

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	MANUFACTURING MATERIALS & METALLURGY	OIL & GAS APPLICATIONS	STEAM TURBINES
	Component Degradation & Failure Analysis	**Wet Gas Compression**	**HP/IP Aerodynamics and Design**
	Technical Session • Svalbard • ThA-24-06	**Technical Session • Nord-Norge • ThA-27-02**	**Technical Session • Romerike • ThA-29-11**
	Session Organizer: **Mohammad Reza Khajavi**, Siemens Energy Session Co-Chair(s): **Douglas Nagy**, Liburdi Engineering	Session Organizer: **Grant Musgrove**, Southwest Research Institute Session Co-Chair(s): **William Maier**, Siemens	Session Organizer: **Shigeki Senoo**, Mitsubishi Heavy Industries, LTD. Session Co-Chair(s): **Alexander Stein**, GE Power
8:00	GT2018:75078 **Isothermal Oxidation of Rene N5 at 1150 deg. C** ***Xiao Huang, Megan Walker**, Carleton University*	GT2018:75058 **Measured Thermodynamic Effect of Wet Gas Compression** ***Sarah Simons, Ryan Cater, Klaus Brun, Grant Musgrove**, Southwest Research Institute; **Rainer Kurz**, Solar Turbines*	GT2018:75269 **Improvement of Steam Turbine Stage Efficiency by Controlling Rotor Shroud Leakage Flows: Part I - Design Concept and Typical Performance of a Swirl Breaker** ***Takanori Shibata**, Mitsubishi Hitachi Power Systems, Ltd.; **Hisataka Fukushima**, Mitsubishi Hitachi Power Systems, Ltd.; **Kiyoshi Segawa**, Mitsubishi Hitachi Power Systems, Ltd.*
8:30	GT2018:75259 **Effect of Pre-Creep Strain on High Cycle Fatigue Life of Ti 834** ***Xijia Wu, Dongyi Seo**, National Research Council Canada; **Marc Head**, **Stephen Chan**, Siemens Canada Limited*	GT2018:75236 **A proposal for shaft power prediction of centrifugal compressor under wet gas conditions** ***Daisuke Kawaguchi, Katsutoshi Kobayashi**, Hitachi, Ltd; **Lars Eirik Bakken**, Norwegian Univ Of Sci & Tech*	GT2018:75270 **Improvement of Steam Turbine Stage Efficiency by Controlling Rotor Shroud Leakage Flows: Part II - Effect of Axial Distance between a Swirl Breaker and Rotor Shroud on Efficiency Improvement** ***Chongfei Duan, Hisataka Fukushima, Kiyoshi Segawa, Takanori Shibata, Hidetoshi Fujii**, Mitsubishi Hitachi Power Systems, Ltd.*
9:00	GT2018:76902 **Acceptability of Defects under Combined Cycle Fatigue for a Precipitation Hardened Steel** ***Luca Patriarca, Stefano Foletti, Stefano Beretta**, Politecnico Di Milano; **Simona Parodi**, **Andrea Riva**, Ansaldo Energia*	GT2018:76188 **Stall And Surge in Wet Compression: Test Rig Development and Experimental Results** ***Enrico Munari, Gianluca D'Elia, Michele Pinelli**, University of Ferrara; **Mirko Morini**, University of Parma; **Pier Ruggero Spina**, Universita Degli Studi Di Ferrara*	GT2018:76528 **Modeling Partial Admission in Control Stages of Small Steam Turbines with CFD** ***Juri Bellucci, Filippo Rubechini, Andrea Arnone**, University Of Florence*
9:30		GT2018:76190 **A Review of Wet Gas Flow Rate Measurements by Means of Single-Phase Meters** ***Enrico Munari**, **Michele Pinelli**, University of Ferrara*	GT2018:76632 **EFFECTS OF INLET CHAMBER STRUCTURE OF THE CONTROL STAGE ON THE UNSTEADY AERODYNAMIC FORCE** ***Keke Gao**, **Chongyu Wang**, **Di Zhang**, Xi'an Jiaotong University; **Yonghui Xie**, Inst of Turbomachinery*

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Numerical and Experimental Methods for Flutter Evaluation	**Magnetic Bearings**	**Frictional Joints I: Underplatform Dampers**
	Technical Session • E-8 • ThA-36-02	**Technical Session • E-6 • ThA-34-08**	**Technical Session • E-7 • ThA-35-05**
	Session Organizer: **Sina C. Stapelfeldt**, Imperial College London Session Co-Chair(s): **Jens Nipkau**, Rolls-Royce Deutschland	Session Organizer: **Timothy Dimond**, Rotor Bearing Solutions International	Session Organizer: **Evgeny Petrov**, The University of Sussex Session Co-Chair(s): **Tianyu Pan**, Duke University/Beihang University; **Sebastian Spengler**, MAN Diesel & Turbo SE
8:00	GT2018:75025 **Experimental Investigation Of An Aerodynamic Mistuned Oscillating Compressor Cascade** ***Leonie Malzacher**, **Valentina Motta**, **Christopher Schwarze**, **Dieter Peitsch**,* *Technische Universitaet Berlin*	GT2018:75273 **Design and evaluation of hybrid magnetic bearings for turbo compressors** ***Cheol Hoon Park**, **Jun Young Park**, **Eui Soo Yoon**,* *Korea Institute of Machinery & Materials*	GT2018:75363 **Influence of Geometric Design Parameters onto Vibratory Response and HCF Safety for Turbine Blades with Friction Damper** ***Matthias Huels**,* *Siemens AG;* ***Lars Panning-von Scheidt**, **Joerg Wallaschek**,* *Leibniz Universitat Hannover*
8:30	GT2018:75294 **Determination of Aerodynamic Damping at High Reduced Frequencies** ***Minghao Pan**, **Tianrui Sun**, **Tobias Gezork**,* *Royal Institute of Technology (KTH);* ***Paul Petrie-Repar**,* *Department of Energy Technology, KTH;* ***Hans Mortensson**,* *GKN Aerospace*	GT2018:76023 **Improvement of Low Frequency Vibration Isolation Capability of AMB Using A Cascade PID Controller** ***Yixin Su**, **Yanhui Ma**, **Yongpeng Gu**, **Suyuan Yu**, **Gexue Ren**,* *Tsinghua University*	GT2018:76974 **Numerical and experimental estimation of the turbine blade damper efficiency** ***Boris Shorr**, **Nikolay Serebryakov**, **Galina Mel'nikova**, **Dmitriy Shadrin**, **Boris Vasilyev**, **Alexander Stadnikov**,* *CIAM*
9:00	GT2018:75300 **AEROELASTIC ANALYSIS OF LAST STAGE LP STEAM TURBINE ROTOR BLADES WITH EXHAUST HOOD FOR VARIOUS NON-NOMINAL REGIMES** ***Romuald Rzadkowski**,* *Institute of Fluid Flow Machinery;* ***Vitaly Gnesin**,* *Ukranian National Academy of Sciences;* ***Lubov Kolodyazhnaya**,* *Institute of Mechanical Engineering Problems;* ***Ryszard Szczepanik**,* *Air Force Institute of Technology*	GT2018:76535 **Vibration isolation of rotating machinery by parameters switched magnetic bearing and high static low dynamic stiffness supports** ***Yanhui Ma**, **Yixin Su**, **Suyuan Yu**,* *Tsinghua University*	GT2018:75961 **CRITERIA FOR BEST PERFORMANCE OF PRE-OPTIMIZED SOLID DAMPERS** ***CHIARA GASTALDI**, **Muzio M. Gola**,* *Politecnico di Torino - DIMEAS*
9:30	GT2018:75502 **The Validation of Flutter Prediction in a Linear Cascade of Non-rigid Turbine Blades** ***Vaclav Slama**, **Bartolomej Rudas**,* *Doosan Skoda Power s.r.o;* ***Jiri Ira**, **Ales Macalka**,* *NUM Solution;* ***Petr Eret**, **Volodymyr Tsymbalyuk**,* *University of West Bohemia*	GT2018:77031 **Floating Shock Platform Testing of a Magnetic Bearing Supported Chiller Compressor - Measurements and Simulation Results** ***Larry Hawkins**, **Zhiyang Wang**,* *Calnetix Technologies;* ***Koman Nambiar**,* *Johnson Controls Navy Systems*	GT2018:76007 **A COMPARISON OF TWO MICROSLIP CONTACT MODELS FOR STUDYING THE MECHANICS OF UNDERPLATFORM DAMPERS** ***Chao Xu**, **Dongwu Li**,* *Northwestern Polytechnical University;* ***Muzio M. Gola**, **CHIARA GASTALDI**,* *POLITECNICO DI TORINO - DIMEAS*

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS
	Supercritical CO2 Oxy-Combustion	**Fan Design - 2**	**Low Pressure Turbine Aerodynamics I**
	Technical Session • Akershus • ThA-38-07	**Technical Session • E-5 • ThA-39-17**	**Technical Session • E-1 • ThA-41-03**
	Session Organizer: **Jacob Delimont,** Southwest Research Institute Session Co-Chair(s): **Robin Ames**, DoE National Energy Technology Lab	Session Organizer: **Mark Wilson,** Rolls-Royce Session Co-Chair(s): **Cesare A. Hall**, Whittle Laboratory	Session Organizer: **Inga Mahle**, MTU Aero Engines AG Session Co-Chair(s): **Fredrik Wallin**, GKN Aerospace Sweden AB
8:00	GT2018:75169 **DEVELOPMENT OF A GLOBAL MECHANISM FOR OXY-METHANE COMBUSTION IN A CO2 ENVIRONMENT** ***Owen Pryor**, UCF-CATER; **Xijia Lu**, 8 Rivers Capital, LLC; **David Freed**, 8 Rivers Capital, NET Power; **Brock Forrest**, 8 Rivers; **Subith Vasu**, University of Central Florida*	GT2018:75861 **CONCEPTUAL DESIGN OF A TAIL-CONE THRUSTER SYSTEM UNDER AXI-SYMMETRIC INLET DISTORTION** ***Byung Joon Lee,** NASA Glenn Research Center, Vantage Partners, LLC; **May-Fun Liou**, **Meng-Sing Liou,** NASA Glenn Research Center*	GT2018:76366 **An Experimental and Numerical Study of Tip-Leakage Flows in an Idealized Turbine Tip Gap at High Mach Numbers** ***Maximilian Passmann**, **Stefan aus der Wiesche,** Muenster University of Applied Sciences Muenster; **Franz Joos**, Helmut Schmidt University*
8:30	GT2018:75547 **A Strategy of Reactant Mixing in Methane Direct-Fired sCO2 Combustors** ***K. R. V. Manikantachari**, **Jose Bobren-Diaz**, **Subith Vasu**, **Jayanta Kapat,** University of Central Florida; **Scott Martin**, Embry-Riddle Aeronautical University; **Ladislav Vesely,** Czech Technical University In Prague*	GT2018:76673 **A PARAMETRIC STUDY OF THE EFFECTS OF INLET DISTORTION ON FAN AERODYNAMIC STABILITY** ***Wenqiang Zhang**, **Mehdi Vahdati,** Imperial College London*	GT2018:75162 **The Effect of Turbulent Scales on Low-Pressure Turbine Aerodynamics - Part A: An Optimized Turbulent Boundary-Condition** ***Christoph Muller-Schindewolffs**, **Florian Herbst**, Leibniz Univ Hannover*
9:00	GT2018:75557 **A Strategy of Mixture preparation for Methane Direct-Fired sCO2 Combustors** ***K. R. V. Manikantachari**, **Jose Bobren-Diaz**, **Jayanta Kapat**, **Subith Vasu,** University of Central Florida; **Ladislav Vesely,** Czech Technical University In Prague; **Scott Martin**, Embry-Riddle Aeronautical University*	GT2018:77221 **Radial Variation in Distortion Transfer and Generation through a Highly Loaded Fan Stage** ***Daniel Soderquist**, **Steven Gorrell,** Brigham Young University; **Michael G. List**, Air Force Research Laboratory*	GT2018:75163 **The Effect of Turbulent Scales on Low-Pressure Turbine Aerodynamics - Part B: Scale Resolving Simulations** ***Felix Schwarzbach**, **Christoph Muller-Schindewolffs**, **Florian Herbst,** Leibniz Univ Hannover; **Christoph Bode**, Technische Universität Braunschweig*
9:30	GT2018:77087 **Computational Modeling of a 1 MW Scale Combustor for Direct Fired sCO2 Power Cycles** ***Jacob Delimont**, **Nathan Andrews,** Southwest Research Institute; **Lalit Chordia**, Thar Energy*	GT2018:75562 **Aerodynamic Design and Testing of an Imbedded Forward Swept Rotor in a Two-Stage Transonic Fan** ***Aspi Wadia**, **John Niedermeier**, **Peter Szucs**, **Nathan Cormier**, **David Crall,** GE Aviation; **Douglas Rabe**, Universal Technology Corporation*	GT2018:75673 **Prediction of Secondary Flow Features in a Low Pressure Turbine** ***Pawel Jonak**, **Slawomir Kubacki**, Institute of Aeronautics and Applied Mechanics, Warsaw University of Technology; **Tomasz Borzecki**, Avio Aero; **Maciej Konopa**, Laboratorium Badan Napedow Lotniczych Polonia Aero Sp. z o.*

THURSDAY, JUNE 14 — 8:00 - 10:00 AM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: NOISE, DUCTS AND INTERACTIONS	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Cavity, Bearings and Seal Design Methods and Applications	**Fan and Engine Noise**	**Stall and Surge in Centrifugal Compressors II**
	Technical Session • E-3 • ThA-42-13	**Technical Session • E-4 • ThA-43-02**	**Technical Session • E-2 • ThA-45-10**
	Session Organizer: **Dr Adele Nasti,** Rolls-Royce plc Session Co-Chair(s): **Michael J Pekris,** University of Surrey	Session Organizer: **Andreas Peters**, GE Aviation Session Co-Chair(s): **Trevor Wood**, General Electric Global Research	Session Organizer: **Mark Celestina,** NASA Glenn Research Center Session Co-Chair(s): **William Cousins**, United Technologies Research Center
8:00	GT2018:75047 **Hybrid RANS-LES for Turbomachinery** ***Richard J Jefferson-Loveday,*** *University of Nottingham*	GT2018:75141 **Compressive Sensing Approach for Aeroengine Fan Noise Mode Detection** ***Huanxian Bu, Xun Huan****g, The Hong Kong University of Science and Technology;* ***Wenjun Yu****, Aero Engine Academy of China, Aero Engine (Group) Corporation of China*	GT2018:77013 **Numerical study of off-design centrifugal compressor operation and flow phenomena proceeding surge.** ***Grzegorz Liskiewicz,*** *Institute of Turbomachinery;* ***Krzysztof Sobczak, Wladyslaw Kryllowicz,*** *Lodz University of Technology;* ***Dr. Matthew Stickland,*** *University Of Strathclyde*
8:30	GT2018:76172 **Computationally Efficient Modelling of Oil Jet Breakup and Film Formation for Bearing Chamber Applications** ***Jee Loong Hee, Kathy Simmons, Bruce Kakimpa, David Hann****, University of Nottingham*	GT2018:75260 **Beamforming and Compressive Sensing Mode Detection of Duct Acoustic Source by Sensor Array** ***Wenjun Yu,*** *Aero Engine Academy of China, Aero Engine (Group) Corporation of China;* ***Huanxian Bu, Xun Huang****, The Hong Kong University of Science and Technology*	GT2018:76727 **Analysis of unstable operation of radial compressor in a system with large plenum volume: Mathematical modeling and experimental results.** ***Andrzej Jaeschke, Kirill Kabalyk, Filip Grapow, Grzegorz Liskiewicz,*** *Lodz University of Technology, Institute of Turbomachinery*
9:00	GT2018:77190 **Evaluating Configurations of Double Surface Helical Groove Seals using Computational Fluid Dynamics** ***Cori Watson, Houston G. Wood,*** *Unviersity of Virginia*	GT2018:77033 **Continuous-Scan Phased Array Measurement Methods for Turbofan Engine Acoustic Testing** ***Parthiv Shah, Andrew White, Dan Hensley,*** *ATA Engineering Inc;* ***Dimitri Papamoschou****, University of California, Irvine;* ***Hovard Vold****, Vold, LLC*	GT2018:76716 **Three dimensional vaneless diffuser rotating stall numerical study** ***Filip Grapow, Grzegorz Liskiewicz,*** *Lodz University of Technology, Institute of Turbomachinery Institute of Turbomachinery*
9:30	GT2018:76177 **Numerical Investigations to Assess the Impact of Shaft Speed on the Performance of Scoop Devices** ***Arun Prabhakar, Kathy Simmons,*** *University of Nottingham;* ***Yousif A Abakr,*** *University of Nottingham Malaysia*	GT2018:76878 **Numerical and Experimental Investigation of Acoustic Characteristics of Model Ultra High Bypass Ratio Counter Rotating Fan** ***ANTON ROSSIKHIN, Iaroslav Druzhinin, Iuri Khaletskii, Victor Mileshin,*** *Central Institute of Aviation Motors*	

THURSDAY, JUNE 14 — 10:15 AM - 12:15 PM

	AIRCRAFT ENGINE	AIRCRAFT ENGINE	CERAMICS
	Engine Icing Panel Session	**Engine Maintenance and On-wing Monitoring of Deterioration**	**Ceramic Matrix Composites: Testing and Modeling - II**
	Panel Session • Nord-Norge • ThB-1-13	**Technical Session • Jan Mayen 2 • ThB-1-14**	**Technical Session • Oslo • ThB-2-02**
	Session Organizer: **Ashlie Flegel**, NASA Glenn Research Center Session Co-Chair(s): **Anthony Nerone**, NASA Glenn Research Center	Session Organizer: **Rory Roberts**, Wright State University Session Co-Chair(s): **Jonathan Sands**, Rolls-Royce Corporation; **Keith Boyer**, Practical Aeronautics	Session Organizer: **Jun Shi**, Rolls-Royce Corporation
10:15	GT2018:77577 **Academia Perspective on Ice Crystal Icing** ***Ilia Roisman***, *Technische Univeristat Darmstadt* GT2018:77578 **Industry Perspective on Ice Crystal Icing** ***Paolo Vanacore***, *GE Aviation* GT2018:77579 **Industry Perspective on Ice Crystal Icing** ***Shezad Nilamdeen***, *ANSYS Canada Ltd* GT2018:77580 **Government Perspective on Ice Crystal Icing** ***Ashlie Flegel***, *NASA Glenn Research Center*	GT2018:75615 **The Assessment of assemblability and dissassemblability of aero engines during preliminary design** ***Jochen Mall, Stephan Staudacher, Christian Koch,*** *University of Stuttgart*	GT2018:75571 **Delamination Fracture in Ceramic Matrix Composites: From Coupons to Components** ***Rajesh Kumar, Matthew Mordasky, Greg Ojard,*** *United Technologies Research Center*
10:45		GT2018:76496 **Measurement Quality Assessment of an On-Wing Engine Thrust Measurement System** ***Marc Bauer, Jens Friedrichs***, *Technische Universitat Braunschweig;* ***Christian Werner-Spatz,*** *Lufthansa Technik AG;* ***Detlev Leo Wulff***, *Institute of Jet Propulsion and Turbomachinery*	GT2018:77068 **Investigating load transfer in ceramic reinforcements** ***Peter Warren, Sanjida Jahan, Ranajay Ghosh, Seetha Raghavan***, *University of Central Florida*
11:15	**P A N E L**	GT2018:75558 **A Top-Down Approach for Quantifying the Contribution of High Pressure Compressor Deterioration Mechanisms to the Performance Deterioration of Turbofan Engines** ***Helena Vogel, Andre Kando, Holger Schulte,*** *MTU Aero Engines AG;* ***Stephan Staudacher***, *Univ. of Stuttgart*	GT2018:77282 **NASA Transformational Tools and Technologies Project's 2700F CMC/EBC Technology Challenge** ***Janet Hurst***, *NASA*
11:45		GT2018:75798 **Foreign Object Damage Diagnosis of Aero-Engine Compressor Based on Damping Averaging Built-in Matrix Method** ***Shuming Wu, Xuefeng Chen, Shibin Wang, Zhi Zhai, Zhibin Zhao***, *Xi'an Jiaotong University;* ***Peter Russhard***, *EMTD Ltd*	

THURSDAY, JUNE 14 — 10:15 AM - 12:15 PM

	COAL, BIOMASS & ALTERNATIVE FUELS	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Alternative Fuels in Aviation and Power Generation	**Jet-in-Crossflow & Swirling Flows II**	**Combustor Design & Development III**
	Panel Session • Sør-Norge• ThB-3-02	**Technical Session • A1-1 • ThB-4-34**	**Technical Session • Jan Mayen 1 • ThB-4-03**
	Session Chair: **Marina Braun-Unkhoff**, DLR Session Co-Chair: **Bhupendra Khandelwal**, Univ of Sheffield	Session Organizer: **Erlendur Steinthorsson**, Parker Hannifin Corp	Session Organizer: **Michael Huth**, Siemens Session Co-Chair(s): **Holger Streb**, Siemens AG; **Adnan Eroglu**, Siemens Switzerland
10:15	GT2018-77611 **Performance of Alternative Fuels in Industrial Gas Turbines Short** ***Erik Munktell,*** *Siemens* GT2018-77612 **Alternative GT Fuels: Achievements and Challenges** ***Michel MOLIERE,*** *University of Technology of Belfort-Montbéliard (UTBM)* GT2018-77613 **Alternative Aviation Fuels – Combustion and Modelling** ***Marina Braun-Unkhoff,*** *DLR* GT2018-77614 **Alternative Fuel Performance: Looking Beyond Emissions and Fuel Systems** ***Bhupendra Khandelwal,*** *University of Sheffield* GT2018-77615 **Future of Aviation Alternative Fuels** ***Simon Blakey,*** *University of Sheffield*	GT2018:76152 **EFFECTS OF A DIVERGING CUP ON SWIRL NUMBER, FLOW PATTERN AND TOPOLOGY OF PREMIXED FLAMES** ***Arthur Degeneve,*** *CentraleSupelec, EM2C laboratory;* ***Paul Jourdaine***, ***Jean Caudal***, *Air Liquide;* ***CLEMENT MIRAT***, *ECOLE CENTRALE PARIS - CNRS -EM2C;* ***Ronan Vicquelin***, *Laboratoire EM2C, CentraleSupelec, CNRS;* ***Thierry Schuller***, *CNRS and Ecole Centrale Paris*	GT2018:75468 **Part-Load Limit Reduction of a Frame 9E Using a Precursor for Combustion Dynamics** ***Driek Rouwenhorst, Robert Widhopf-Fenk, Jakob Hermann,*** *IfTA Ingenieurbuero fuer Thermoakustik GmbH;* ***Matthias Haringer***, *Fakultät für Machinenwesen;* ***Julius Becker***, ***Juergen Gerhard***, ***Julian Niedermeier***, *SWM - Stadtwerke Muenchen*
10:45		GT2018:76239 **Unsteady Aspects of Multi-Interacting Swirlers Using POD Analysis** ***Foad Vashahi***, ***Shahnaz Rezaei***, ***Jeekeun Lee***, *Chonbuk National University*	GT2018:77072 **Combustion Dynamics Monitoring Considerations for Systems with Autotuning** ***Benjamin Emerson, Chris Perullo, Tim Lieuwen,*** *Georgia Institute of Technology* ***David Noble, Leonard Angello,*** *Electric Power Research Institute;* ***Scott Sheppard***, ***Jared Kee***, *Turbine Logic*
11:15	**P A N E L**	GT2018:76282 **Experimental Investigation of Ignition and LBO Characteristics of SPP Injector: The Effect of Pilot Stage Air Split Ratio** ***Jinhu Yang, Cunxi Liu,*** *Institute of Engineering Thermophysics, Chinese Academy of Sciences;* ***Haowei Wu, B****eijing Power Machinery Institute;* ***Fuqiang Liu, Yong Mu, Chunyan Hu, Gang Xu,*** *Institute of Engineering Thermophysics*	GT2018:76234 **Reduction of Burner Variants for Differing Fuel Compositions by Combining Intelligent Control Methods and Experimental Data of Siemens SGT-400 Dry Low Emission Combustion System** ***Phillip Hubbard, Kexin Liu, Suresh Sadasivuni, Ghenadie Bulat,*** *Siemens Industrial Turbomachinery Ltd.*
11:45		GT2018:77047 **Effects of Reacting Conditions on Flow Fields in a Swirl Stabilized Lean Premixed Can Combustor** ***Suhyeon Park***, ***Siddhartha Gadiraju***, ***Jaideep Pandit***, *Virginia Polytechnic Institute & State University;* ***Srinath Ekkad***, *North Carolina State University;* ***Federico Liberatore***, ***Yin-hsiang Ho***, ***Ram Srinivasan,*** *Solar Turbines*	GT2018:76587 **Dry low NOx Emissions Operability Enhancement of a Heavy-Duty Gas Turbine by means of Fuel Burner Design Development and Testing** ***Matteo Cerutti, Nicola Giannini, Gianni Ceccherini, Roberto Meloni, Emanuele Matoni, Christian Romano, Giovanni Riccio,*** *Baker Hughes, a GE company*

THURSDAY, JUNE 14 — 10:15 AM - 12:15 PM

	COMBUSTION, FUELS & EMISSIONS	CONTROLS, DIAGNOSTICS & INSTRUMENTATION	CYCLE INNOVATIONS
	Novel Combustor Concept II	**Topics in Controls**	**Introduction to Gas Turbine Conceptual Design and Technological Perspectives Joint with Aircraft Engine Committee**
	Technical Session • Jan Mayen 3 • ThB-4-07	**Technical Session • Event Room • ThB-5-01**	**Tutorial Session • Hordaland • ThB-6-11**
	Session Organizer: **Peter Stuttaford,** Power Systems Mfg Session Co-Chair(s): **Leonard Angello**, EPRI	Session Organizer: **Chad Holcomb**, Solar Turbines Inc. Session Co-Chair(s): **Alex Tsai**, U.S. Coast Guard Academy; **Bill Rhoden**, UTC Aerospace Systems	Session Chair: **Konstantinos Kyprianidis**, Mälardalen University Session Co-Chair: **Magnus Genrup**, Lund University
10:15	GT2018:75878 **Detailed Chemical Kinetics Based Simulation of Detonation-containing Flows** ***Takuma Sato, Venkat Raman,*** *University of Michigan;* ***Stephen Voelkel****, Los Alamos National Laboratory*	GT2018:75128 **Transient performance of separated flows: Characterization and active flow control** ***Jorge Saavedra, Guillermo Paniagua,*** *Purdue University*	GT2018:77647 **Introduction to Gas Turbine Conceptual Design and Technological Perspectives Joint with Aircraft Engine Committee** ***Konstantinos Kyprianidis,*** *Mälardalen University*
10:45	GT2018:77258 **EXPERIMENTAL ANALYSIS OF WAVE PROPAGATION IN A METHANE-FUELED ROTATING DETONATION COMBUSTOR** ***Cooper Welch, Daniel Depperschmidt, Robert Miller, Jonathan Tobias, Mruthunjaya Uddi, Ajay Agrawal,*** *University of Alabama;* ***Scott Lowe****, Aerojet Rocketdyne*	GT2018:76399 **Dynamic Modelling and Control of a Compressor Using Chebyshev Polynomial Approximation** ***Marta Zagorowska, Nina F. Thornhill,*** *Imperial College London;* ***Charlotte Skourup****, ABB AS*	**T U T O R I A L**
11:15	GT2018:76842 **Numerical Study On NOx Reduction In Pulse Detonation Combustion By Using Steam Injection Decoupled From Detonation Development** ***Niclas Hanraths, Fabian Tolkmitt, Neda Djordjevic,*** *Technische Universitat Berlin;* ***Phillip Berndt****, Freie Universität Berlin*	GT2018:75295 **Fuel injection control for a valve array in a Shockless Explosion Combustor** ***Jan-Simon Schapel, Fatma Yucel, Fabian Volzke,*** *Technische Universitaet Berlin;* ***Rupert Klein,*** *Freie Universität Berlin;* ***Christian Oliver Paschereit, Rudibert King****, Technische Universitaet Berlin*	
11:45	GT2018:75338 **A New Spin on Small Scale Combustor Geometry** ***Brian T. Bohan****, Air Force Institute of Technology;* ***Marc D. Polanka,*** *AFIT/ENY*		

THURSDAY, JUNE 14 — 10:15 AM - 12:15 PM

	HEAT TRANSFER: GENERAL EXPERIMENTAL HEAT TRANSFER	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	HEAT TRANSFER: MULTIPHYSICS MODELING & OPTIMIZATION
	Blade Tip, Shroud and Casing Heat Transfer	**Brush, Leaf, and Labyrinth Seals**	**Multiphysics Modeling & Optimization**
	Technical Session • A1-4 + A1-5 • ThB-13-02	**Technical Session • A1-2 • ThB-15-04**	**Technical Session • A1-6 • ThB-20-01**
	Session Organizer: **Seth Lawson,** U.S. Department of Energy Session Co-Chair(s): **Mike Barringer**, Pennsylvania State University	Session Organizer: **Aaron Bowsher**, Cross Session Co-Chair(s): **Neelesh Sarawate**, GE Global Research	Session Organizer: **Kenneth Suder**, NASA Glenn Research Center Session Co-Chair(s): **SANJAY CHOPRA**, GE AVIATION
10:15	GT2018:75463 **Experimental Investigation of Heat Transfer in Cavities of Steam Turbine Casings under Generic Test Rig Conditions** ***David Spura, Gunter Eschmann, Wieland Uffrecht,*** *Technische Universitat Dresden;* ***Uwe Gampe****, University of Dresden*	GT2018:76194 **Pressure Distributions below Brush Seals at Varying Operating Conditions** ***Fabian Schur, Jens Friedrichs,*** *TU Braunschweig;* ***Johan Flegler****, Siemens AG;* ***Christos Georgakis,*** *GE Power;* ***Thomas Polklas****, MAN Turbo AG*	GT2018:76201 **Adaptive Preliminary-Design Workflow for Aero Engine Secondary Air System Cavities with an Application Case of Windage and Heat Transfer in a Rotor-Stator Cavity with axial Throughflow** ***Toni Wildow, Klaus Hoschler,*** *Brandenburg University of Technology Cottbus-Senftenberg;* ***Hubert Dengg****,* ***Jonathan Sommerfeld****, Rolls Royce Deutschland Ltd Co KG*
10:45	GT2018:76564 **Experimental and Numerical Investigation of Optimized Blade Tip Shapes - Part I: Turbine Rainbow Rotor Testing and CFD Methods** ***Bogdan Cezar Cernat, Marek Paty, Sergio Lavagnoli,*** *von Karman Institute for Fluid Dynamics;* ***Cis De Maesschalck,*** *Rolls-Royce plc*	GT2018:76202 **An analytical pressure and leakage model for leaf seals** ***Gregor Nicht, Reinhard Willinger,*** *Technische Universitat Wien*	GT2018:75616 **Multi-Objective Optimization of the Cooling Configuration of a High Pressure Turbine Blade** ***Frank Wagner, Arnold Kuehhorn,*** *Brandenburg University of Technology Cottbus-Senftenberg;* ***Timm Janetzke****,* ***Ulf Gerstberger****, Rolls-Royce Deutschland*
11:15	GT2018:76567 **Experimental and Numerical Investigation of Optimized Blade Tip Shapes - Part II: Tip Flow Analysis and Loss Mechanisms** ***Marek Paty, Bogdan Cezar Cernat, Sergio Lavagnoli,*** *von Karman Institute for Fluid Dynamics;* ***Cis De Maesschalck,*** *Rolls-Royce plc*	GT2018:76235 **Experimental and Numerical Investigations on Leakage Flow Characteristics of Two Kinds of Brush Seals** ***Yuanqiao Zhang, Jun Li, Xin YAN, ZHIGANG LI,*** *Xi'An Jiaotong University*	GT2018:76424 **Robust Film Cooling Hole Shape Optimization Considering Surface Roughness and Partial Hole Blockage** ***Sanga Lee, Wontae Hwang, Kwanjung Yee,*** *Seoul National University*
11:45	GT2018:76685 **A Novel Experimental Technique for Investigating Natural Convective Heat Transfer in a Gas Turbine Annulus** ***Daniel Fahy, Peter Ireland,*** *University of Oxford;* ***Leo Lewis, Emile Raya,*** *Rolls Royce*	GT2018:75782 **Enhancement of Labyrinth Seals Efficiency by Means of a Multi-Objective Optimization Technique** ***Mikhail Gritckevich, Kunyuan Zhou, Vincent Peltier, Markus Raben, Olga Galchenko,*** *Siemens*	GT2018:76208 **Structural Analysis of Profiled Tubes for a Turbofan Engine Supercritical-CO2 Bottoming Cycle Heat Exchanger** ***Jon Rengel, Florian Jacob, Andrew Rolt, Vishal Sethi****, Cranfield University*

	HEAT TRANSFER: NUMERICAL FILM COOLING	MANUFACTURING MATERIALS & METALLURGY	STEAM TURBINES
	Numerical Simulation of Vane & Blades Film Cooling Design	**Additive Manufacturing - Materials, Processes and Design for Gas Turbines**	**Valves & Seals**
	Technical Session • A1-3 • ThB-12-01	**Tutorial Session • Svalbard • ThB-24-15**	**Technical Session • Romerike • ThB-29-09**
	Session Organizer: **Savas Yavuzkurt**, The Pennsylvania State University Session Co-Chair(s): **Thomas Dyson**, GE Global Research	Session Organizer: **Henry Bernstein**, Gas Turbine Materials Assoc	Session Organizer: **Cosimo Bianchini**, Ergon Research Session Co-Chair(s): **Zhenping Feng**, Xi'An Jiaotong University
10:15	GT2018:75035 **Dynamics of Coherent Structures and Random Turbulence in Pressure Side Film Cooling on a First Stage Turbine Vane** ***Silvia Ravelli**, University of Bergamo; **Giovanna Barigozzi**, Università Di Bergamo*	GT2018:77470 **Additive Manufacturing -- Materials, Processes and Design for Gas Turbines** ***Henry Bernstein**, Gas Turbine Materials Assoc*	GT2018:75094 **A test rig concept to study fluid structure interactions in a steam turbine valve** ***Stefan Wallat, Clemens Domnick, Dieter Brillert**, University of Duisburg Essen; **Christian Musch**, Siemens AG*
10:45	GT2018:75114 **Numerical Study on the Effects of V-Shaped Rib Angle on Film Cooling Performance for Turbine Blade Trailing Edge** ***Lin Ye, Cunliang Liu, Haiyong Liu, Qijiao He, Gang Xie**, Northwestern Polytechnical University*	TUTORIAL	GT2018:75312 **POD and extended-POD analysis of pressure fluctuations and vortex structures inside a steam turbine control valve** ***Peng Wang, Hongyu Ma, Yingzheng Liu**, Shanghai Jiao Tong University*
11:15	GT2018:75173 **NUMERICAL STUDY ON FILM COOLING CHARACTERISTICS OF C3X VANE WITH WAVE-TRENCH HOLE** ***BoLun ZHANG, Li ZHANG, Huiren Zhu, Jiansheng WEI, Zhong-Yi Fu, Chun-yi Yao**, Northwestern Polytechnical University*		GT2018:75835 **Application of Fluidic Curtains to Turbine Rotor Tip Seal Geometries** ***James Maccalman, Simon Hogg, Grant Ingram**, Durham University*
11:45			GT2018:76336 **The Physical Mechanism of Tip Leakage Loss Reduction by Means of Passive Injection in Low Mach Number Flows** ***Maximilian Passmann, Stefan aus der Wiesche**, University of Applied Sciences Muenster; **Franz Joos**, Helmut Schmidt University; **Reinhard Willinger**, Technische Universitat Wien*

	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING
	Flutter Sensitivity to Specific Parameters	**Seals 3**	**Frictional Joints II: Shrouds, Flanges, Bolts, and Root Joints**
	Technical Session • E-8 • ThB-36-03	**Technical Session • E-6 • ThB-34-07**	**Technical Session • E-7 • ThB-35-06**
	Session Organizer: **Almudena Vega**, SIEMENS Gamesa Session Co-Chair(s): **Paul Petrie-Repar,** Department of Energy Technology, KTH	Session Organizer: **Giuseppe Vannini,** GE Oil & Gas Session Co-Chair(s): **Paolo Pennacchi,** Poitecnico di Milano	Session Organizer: **Malte Krack**, University of Stuttgart Session Co-Chair(s): **Lars Panning-von Scheidt**, Leibniz Universitat Hannover
10:15	GT2018:75762 **Study Of The Impact Of Multi-Row Interaction On Flutter Analysis For A Representative LPT Geometry** ***Adrian Sotillo, Juan Manuel Gallardo,*** *Industria de Turbo Propulsores S.A.*	GT2018:75414 **On the Influence of the Entrance Section on the rotordynamic performance of a Pump Seal with Uniform Clearance: a Sharp Edge VS. a Round Inlet** ***Jing Yang, Luis San Andres,*** *Texas A&M University*	GT2018:75303 **Numerical Assessment of Reduced Order Modelling Techniques for Dynamical Analysis of Joint Structures with Contact Nonlinearities** ***Jie Yuan, Fadi El Haddad,*** *Imperial College London;* ***Loic Salles****, VUTC Imperial College London;* ***Chian Wong****, Rolls-Royce Plc*
10:45	GT2018:76422 **The Influence of Circumferential Grooves on the Flutter Stability of a Transonic Fan** ***Matthias Kniefs, Martin Lange, Ronald Mailach,*** *Technische Universitat Dresden;* ***Senad Iseni****,* ***Derek Micallef****,* ***Francesca di Mare,*** *Ruhr-Univeritat Bochum*	GT2018:75458 **Coupled Thermal-Structural-Fluid Numerical Analysis of Gas Lubricated Mechanical Seals** ***Jingjing Luo, Hans Josef Dohmen, Friedrich-karl Benra,*** *University Duisburg-Essen*	GT2018:76546 **Analysis of nonlinear modal damping due to friction at blade roots using high-fidelity modelling** ***Junjie Chen, Biao Zhou,*** *Nanjing University of Aeronautics and Astronautics;* ***Chaoping Zang****, The College of Energy and Power Engineering;* ***Evgeny Petrov****, The University of Sussex*
11:15	GT2018:76777 **Influence of Intrarow Interaction on the Aerodynamic Damping of an Axial Turbine Stage** ***Tobias R. Muller, Damian Vogt,*** *University of Stuttgart;* ***Klemens Vogel****,* ***Bent Aamand Phillipsen****, ABB Turbo Systems*	GT2018:75503 **Experimental Investigation and Numerical Validation of the Bearing Face Flow of an Adaptive Seal** ***Anna-Lisa Zimmermann, Volker Guemmer,*** *Technical University of Munich;* ***Tue Nguyen****,* ***Rogier Giepman****, GE Global Research*	GT2018:76692 **Numerical and Experimental Study of Shrouded Blade Dynamics considering Variable Operating Points** ***Ferhat Kaptan, Lars Panning-von Scheidt, Joerg Wallaschek,*** *Leibniz Universitat Hannover*
11:45	GT2018:76930 **Flutter Analysis of a Flexible UHBR Fan at Different Flight Conditions** ***Matthias Schuff, Jannik Reisberg****, German Aerospace Center*	GT2018:77126 **Development of a Non-Contacting Mechanical Seal for High Performance Turbocharger Applications** ***Daniel Nelson,*** *Flowserve Corp*	

THURSDAY, JUNE 14 — 10:15 AM - 12:15 PM

	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: NOISE, DUCTS AND INTERACTIONS	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY
	Compressor Design Methods and Applications	**Compressor and Combustion Noise**	**Unsteady Flows in Centrifugal Compressors**
	Technical Session • E-3 • ThB-42-04	**Technical Session • E-2 • ThB-43-01**	**Technical Session • E-5 • ThB-45-09**
	Session Organizer: **Mansour Mahmoud**, Honeywell International Session Co-Chair(s): **Jaeho Choi**, Hanwha Techwin	Session Organizer: **Jean-Michel Lourier**, GE Aviation Session Co-Chair(s): **Alessandro Corsini**, 'sapienzà University Of Rome	Session Organizer: **Michael Barton**, Honeywell
10:15	GT2018:76537 **Assessment of Scale Adaptive Simulation of a Rotor of High Pressure Compressor** ***Julien Marty, Helene Gaible, Herve Bezard,*** *ONERA*	GT2018:75062 **Study of combustion noise generation in a realistic turbine stage configuration** ***Cesar Becerril, Laurent Y.M. Gicquel,*** *CERFACS;* ***Stephane Moreau,*** *Universite de Sherbrooke*	GT2018:75584 **Influence of Flow Coefficient on the Unsteady Impeller Loading Induced by the Impeller-Diffuser Interaction** ***Dongjae Kong, Seung Jin Song,*** *Seoul National University*
10:45	GT2018:76668 **Numerical Study of Deterministic Fluxes in Compressor Passages** ***Feng Wang, Mauro Carnevale,*** *Luca Di Mare, University of Oxford*	GT2018:76815 **Impact of Ported Shroud Casing Treatment on the Acoustics of Centrifugal Compressor** ***Sidharath Sharma, J.M. Allport, Martyn Jupp,*** *University of Huddersfield;* ***Jorge Garcia Tiscar,*** *Universitat Politecnica de Valencia;* ***Ambrose Nickson,*** *Borgwarner Turbo Systems*	GT2018:76596 **Analysis of Unsteady Flow Structures in an Radial Turbomachine by using Proper Orthogonal Decomposition** ***Matthias Witte, Benjamin Torner, Frank-Hendrik Wurm,*** *University Rostock*
11:15	GT2018:75466 **CFD Study on the Influence of Geometric Parameters on the Aerodynamics within an Ejector Injection System for Compressor Stabilization** ***Sebastian Brehm, Felix Kern, Reinhard Niehuis,*** *Universitaet der Bundeswehr Muenchen - Institute of Jet Propulsion*	GT2018:76762 **APU-Noise Reduction by Novel Muffler Concepts** ***Karsten Knobloch, Lars Enghardt, Friedrich Bake,*** *German Aerospace Center (DLR)*	GT2018:77095 **A Modeling Framework Capable of Characterizing the Dynamics of POGO Oscillations in Space Rocket Turbopumps** ***Angelo Pasini, Mario Amoroso,*** *University of Pisa*
11:45	GT2018:76770 **Maximum Loading Capacity of Tandem Blades in Axial Compressors** ***Baojie Liu, Du Fu, Xianjun Yu,*** *Beihang University*	GT2018:76382 **RESEARCH ON ACCURACY OF FLOWING FIELD BASED ON NUMERICAL SIMULATION FOR TONAL NOISE PREDICTION IN AXIAL COMPRESSOR** ***Moru Song, Bo Yang, Guangming Dong, Xiaolan Liu, Jiaqi Wang, Hong Xie, Zhenhua Lu,*** *Shanghai Jiao Tong University*	GT2018:76869 **Identification of Cavitation Instabilities on a Three-Bladed Inducer by Means of Strain Gages** ***Ruzbeh Hadavandi, Giovanni Pace, Dario Valentini,*** *Sitael S.p.A;* ***Angelo Pasini, Luca d'Agostino,*** *University of Pisa*

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS
	Turbo Machinery Design for Supercritical CO2 Applications	**Transonic Compressor Design**	**Tip Leakage Flows**
	Tutorial Session • Akershus • ThB-38-11	**Technical Session • E-1 • ThB-39-05**	**Technical Session • E-4 • ThB-41-02**
	Session Organizer: **J. Jeffrey Moore,** Southwest Research Institute Session Co-Chair(s): **Timothy Allison**, Southwest Research Institute	Session Organizer: **Sungho Yoon**, GE Global Research Session Co-Chair(s): **Lisa Brilliant**, UTC/Pratt & Whitney	Session Organizer: **Sergio Lavagnoli**, von Karman Institute for Fluid Dynamics Session Co-Chair(s): **Cis De Maesschalck**, Rolls-Royce plc
10:15	GT2018:77479 **Turbo Machinery Design for Supercritical CO2 Applications** ***J. Jeffrey Moore, Timothy Allison**, Southwest Research Institute*	GT2018:75124 **Off-Design Prediction of Transonic Axial Compressors, Part 1: Mean-Line Code and Tuning Factors** ***John Kidikian**, **Marcelo Reggio**, Polytechnique Montreal*	GT2018:75138 **Aerodynamic Interaction between Incoming Vortex and Tip Leakage Flow in a Turbine Cascade** ***Kai Zhou**, **Chao Zhou**, Peking University*
10:45	**T U T O R I A L**	GT2018:75125 **Off-Design Prediction of Transonic Axial Compressors, Part 2: Generalized Mean-Line Loss Modelling Methodology** ***John Kidikian**, **Marcelo Reggio**, Polytechnique Montreal*	GT2018:75416 **Effect of Tip Shroud Geometries on Last Turbine Stage Efficiency** ***Andrey Granovskiy**, **Igor Afanasiev**, Lulka Design Bureau*
11:15		GT2018:75528 **THE PRESENT CHALLENGE OF TRANSONIC COMPRESSOR BLADE DESIGN** ***Alexander Hergt**, **Joachim Klinner**, **Jens Wellner**, **Christian Willert**, **Sebastian Grund**, **Wolfgang Steinert**, **Manfred Beversdorff**, German Aerospace Center DLR*	GT2018:76680 **Tip Leakage Flow Reduction of a Linear Turbine Cascade Using String-type DBD Plasma Actuators** ***Takayuki Matsunuma**, **Takehiko Segawa**, National Institute of Advanced Industrial Science and Technology (AIST)*
11:45		GT2018:77065 **USING SHOCK CONTROL BUMPS TO IMPROVE FAN/COMPRESSOR BLADE PERFORMANCE** ***AListair John**, **Ning Qin**, Sheffield University; **Shahrokh Shahpar**, Rolls-Royce plc., ML-83*	GT2018:76994 **An Experimental Study of Using Vortex Generators as Tip Leakage Flow Interrupters in an Axial Flow Turbine Stage** ***Cengiz Camci**, **Veerandra C. Andichamy**, **Gohar T. Khokhar**, The Pennsylvania State University*

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Thermal Management Systems and Aero-engine Oil Systems	**Pressure Gain Combustion**	**Combustor Design & Development I**
	Technical Session • Jan Mayen 2 • ThC-1-04 Part A	**Panel Session • Jan Mayen 3 • ThC-4-35 Part A**	**Technical Session • A1-1 • ThC-4-04 Part A**
	Session Organizer: **Michael Flouros,** MTU Aero Engines AG Session Co-Chair(s): **Aaron Byerley**, United States Air Force Academy	Session Organizer: **Ajay Agrawal**, University of Alabama Session Co-Chair(s): **Donald Ferguson**, National Energy Technology Laboratory - DOE	Session Organizer: **Michael Duesing**, Ansaldo Energia Session Co-Chair(s): **Jenny Larfeldt**, Siemens Industrial Turbomachinery AB; **Mirko R. Bothien**, Ansaldo Energia Switzerland
2:00	GT2018:75083 **Developments of a Flow Visualization Borescope and a Two-phase Flow Probe for Aeroengine Transmission Gears** ***Hidenori Arisawa, Yuji Shinoda, Yoshiyuki Noguchi, Tatsuhiko Goi, Takahiko Banno, Hirofumi Akahori,*** *Kawasaki Heavy Industries, LTD.*	GT2018:77565 **Rotary Detonation Combustor Versus Deflagration Constant Volume Combustion: Issues and Challenges** ***Bernard Robic***, Safran Aircraft Engines GT2018:77567 **Fuel Injection Challenges on RDE Combustor Operation and Delivered Performance** ***Christopher Brophy***, Naval Postgraduate Laboratory GT2018:77545 **An Overview of Rotating Detonation Engine Development at Aerojet Rocketdyne** ***Scott Claflin***, Aerojet Rocketdyne GT2018:77568 **Pressure Gain Combustion Research at General Electric** ***Anthony Dean,*** *General Electric Global Research Center*	GT2018:76374 **Extended Range of Fuel Capability for GT13E2 AEV Burner with Liquid and Gaseous Fuels** ***Martin Zajadatz, Felix Guthe, Ewald Freitag, Theodoros Ferreira-Providakis, Torsten Wind, Fulvio Magni****, General Electric (Switzerland) GmbH;* ***Jeffrey Goldmeer****, GE Energy*
2:30	GT2018:75721 **Numerical Investigation on Bearing Chamber Wall Heat Transfer** ***Volkan Tatar, Altug Piskin,*** *TUSAS Engine Industry*		GT2018:76765 **Numerical and experimental investigation on an effusion-cooled lean burn aeronautical combustor: aerothermal field and emissions** ***Lorenzo Mazzei, Stefano Puggelli, Davide Bertini, Antonio Andreini,*** *University of Florence* ***Bruno Facchini****, University of Florence;* ***Ignazio Vitale****, Avio Aero;* ***Antonio Santoriello****, GE Avio s.r.l*
3:00	GT2018:75989 **Simulation and analysis of oil scoop capture efficiency** ***Yaguo Lyu, Le Jiang, Zhenxia Liu, Jianping Hu,*** *Northwestern Polytechnical University*	**P A N E L**	

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	CYCLE INNOVATIONS	ELECTRIC POWER	HEAT TRANSFER: ADDITIVE MANUFACTURING
	Cycle Performance Simulation I	**Gas Turbine Development**	**Additive Manufacturing I**
	Technical Session • Hordaland • ThC-6-07	**Technical Session • A1-6 • ThC-8-03**	**Technical Session • A1-4 + A1-5 • ThC-21-01**
	Session Organizer: **Konstantinos Kyprianidis**, Mälardalen University Session Co-Chair(s): **Mikael Stenfelt**, SAAB	Session Organizer: **William Day**, Longview Energy Associates Session Co-Chair(s): **Jeffrey Benoit**, Power Systems Mfg LLC (PSM)-Ansaldo Energia Group	Session Organizer: **Hongzhou Xu**, Solar Turbines Inc Session Co-Chair(s): **Jayanta Kapat**, University of Central Florida
2:00	GT2018:75751 **Performance Simulation and Analysis of Gas Turbine Engine Using Drop-In Bio-Fuels** ***Yiguang Li, Jason Rubie, Anthony Jackson,*** *Cranfield University*	GT2018:76665 **Ansaldo Energia Gas Turbine Technology Developments** ***Alessandro Ramaglia****, Ansaldo Energia;* ***Uwe Ruedel****,* ***Vasileios Stefanis****,* ***Stefan Florjancic****, Ansaldo Energia Switzerland Ltd*	GT2018:75019 **Experimental Study on Pressure Losses in Porous Materials** ***Giacomo Fantozzi****,* ***Mats Kinell****,* ***Sara Rabal Carrera****,* ***Jenny Nilsson****, Siemens Industrial Turbomachinery AB;* ***Yves Kuesters****, Siemens AG*
2:30	GT2018:76500 **Applying Dynamic Programming Algorithms to the Energy Management of Hybrid Electric Aircraft** ***Teresa Donateo, Antonio Ficarella, Luigi Spedicato,*** *University of Salento*	GT2018:77273 **Evolution of MHPS Large Frame Gas Turbines : J to Air Cooled JAC** ***Kentaro Suzuki, Yoshikazu Matsumura, Kazumasa Takata, Junichiro Masada,*** *MHPS;* ***Satoshi Hada****,* ***Masanori Yuri****, Mitsubishi Hitachi Power Sysytems, Ltd.*	GT2018:76166 **Experimental Investigation on Additively Manufactured Transpiration and Film Cooling Structures** *Zheng Min, Sarwesh Parbat, Li Yang, Minking Chyu, Univ Of Pittsburgh; Gan Huang, Tsinghua University*
3:00	GT2018:76230 **Start-Up Optimization Of a CCGT Power Station Using Model Based Gas Turbine Control** ***Alessandro Nannarone,*** *Technische Universiteit Delft;* ***Sikke A. Klein****, Delft University of Technology - Process and Energy department*	GT2018:77274 **MHPS Advanced Gas Turbine Development, Part-2: F Series** ***Kiyoshi Fujimoto****,* ***Yuya Fukunaga****,* ***Junichiro Masada****, MHPS;* ***Satoshi Hada****,* ***Toshishige Ai,*** ***Masanori Yuri,*** *Mitsubishi Hitachi Power Sysytems, Ltd.*	

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	INDUSTRIAL & COGENERATION
	Methods and Analysis for Film Cooling	**Rotor Cavities**	**Design and Evaluation Considerations of Waste Heat Recovery Technologies**
	Technical Session • A1-3 • ThC-19-07 Part A	**Technical Session • A1-2 • ThC-15-08 Part A**	**Tutorial Session • Akershus • ThC-23-09 Part A**
	Session Organizer: **Paul Giel,** VPL at NASA Glenn Session Co-Chair(s): **Eric Ruggiero**, GE Aviation	Session Organizer: **Dr. Alexander V. Mirzamoghadam,** Honeywell Aerospace Session Co-Chair(s): **James Scobie**, University of Bath	Session Organizer: **Leonid Moroz**, Softinway Inc. Session Co-Chair(s): **Clement Joly**, SoftInWay; **Abdul Nassar**, Softinway Turbomachinery Solutions Pvt Ltd
2:00	GT2018:76421 **Effect of Row Spacing on the Accuracy of Film Cooling Superposition Method** ***Lang Wang, XUEYING LI, Jing Ren, Hongde Jiang**, Tsinghua University*	GT2018:75060 **Telemetric Heat Transfer Coefficient Measurements in an Open Rotor Stator System Air Gap at up to 8500 Rpm** ***Benjamin Heinschke,** Dresden University of Technology; **Wieland Uffrecht**, Technische Universitat Dresden; **Stefan Odenbach**, TU Dresden; **Volker Caspary**, MAN Turbo AG*	GT2018:77596 **Design and Evaluation Considerations of Waste Heat Recovery Technologies** ***Clement Joly, Leonid Moroz,** Softinway Inc.; **Abdul Nassar**, Softinway Turbomachinery Solutions Pvt Ltd*
2:30	GT2018:76451 **Active turbulence generation for film cooling investigations** ***Amirabas Bakhtiari, Tobias Sander, Michael Straußwald**, Bundeswehr University Munich; **Michael Pfitzner**, UniBW Muchen*	GT2018:75264 **Modeling of the Cavity Response to Rapid Transient Considering the Effect of Heat Transfer** ***Shuiting Ding, Hang Yu, Tian Qiu, Chuankai Liu**, Beihang University*	**T U T O R I A L**
3:00	GT2018:76964 **FLOW STATISTICS AND VISUALISATION OF MULTI-ROW FILM COOLING BOUNDARY LAYERS** ***Justin Hodges,** Center for Advanced Turbomachinery and Energy Research; **Craig Fernandes, Erik Fernandez, Jayanta Kapat**, University of Central Florida*	GT2018:75497 **Formation and Evolution of Rayliegh-Benard Streaks in Rotating Cavities** ***Mark R. Puttock-Brown,** Thermo-Fluid Mechanics Research Centre; **Martin G. Rose,** Thermo-Fluid Mechanics Research Centre (TFMRC), University of Sussex*	

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	MANUFACTURING MATERIALS & METALLURGY	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	OIL & GAS APPLICATIONS
	Turbomachinery Manufacturing	**Turbochargers - Turbines 3**	**Fouling and Degradation**
	Technical Session • Svalbard • ThC-24-09	**Technical Session • Oslo • ThC-26-07**	**Technical Session • Sør-Norge• ThC-27-05**
	Session Organizer: **Benjamin Doebbeler**, WZL of RWTH Aachen University Session Co-Chair(s): **Surinder Pabla**, GE Energy; **Matthias Brockmann**, WZL RWTH Aachen	Session Organizer: **Jose Ramon Serrano,** Universitat Politecnica de Valencia Session Co-Chair(s): **Lukas Benjamin Inhestern**, CMT/ Universitat Politecnica De Valencia	Session Organizer: **Rainer Kurz**, Solar Turbines
2:00	GT2018:75190 **Assessment of Different Technology Chains for Fir Tree Manufacturing: A Case Study** **Fritz Klocke, Martin Seimann, Marvin *Binder*, *Benjamin Doebbeler***, *WZL of RWTH Aachen University*	GT2018:75452 **On the Choice of Turbine Type For a Twin-Turbine Heavy-Duty Turbocharger Concept** ***Nicholas Anton*, *Carl Fredriksson*, *Per-Inge Larsson***, *Scania CV AB;* ***Magnus Genrup***, *Lund University;* ***Anders Christiansen-Erlandsson,*** *Royal Institute of Technology*	GT2018:75613 **Gas Turbine Fouling offshore; air intake filtration optimization** *Stian Madsen, Statoil ASA; Jorn Watvedt, Widemore AS; Lars Eirik Bakken, Norwegian Univ Of Sci & Tech*
2:30	GT2018:76910 **Evaluation of Wire Electrochemical Machining with Rotating Electrode for the Manufacture of Fir Tree Slots** ***Fritz Klocke,*** *WZL of RWTH Aachen University;* ***Tim Herrig***, ***Andreas Klink***, *Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University*	GT2018:76590 **DOUBLE SCROLL TURBINE FOR AUTOMOTIVE APPLICATIONS: Engine operating point versus dynamic blade stress from forced response vibration** ***David Hemberger*, *Dietmar Filsinger*, *Roberto De Santis,*** *IHI Charging Systems International*	GT2018:75618 **Gas Turbine Fouling offshore; effective online water wash through high water-to-air ratio** ***Stian Madsen,*** *Statoil ASA;* ***Lars Eirik Bakken***, *Norwegian Univ Of Sci & Tech*
3:00	GT2018:77195 **Approach for zero defect manufacturing: Geometric calibration of five-axis machine tools for blisk manufacturing process** ***Tae Hun Lee*, *Jan Behrens*, *Sascha Gierlings*,** *Fraunhofer IPT;* ***Christian Brecher***, *Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University*		GT2018:76947 **Gas Turbine Fouling: A comparison Among One Hundred Heavy-Duty Frames** ***Nicola Aldi*, *Nicola Casari*, *Michele Pinelli*, *Pier Ruggero Spina*, *Alessio Suman*,** *University of Ferrara* ***Mirko Morini***, *University of Parma*

	STEAM TURBINES	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
	Steam Turbines Tutorial	**Forced Response I**	**Squeeze Film Dampers**
	Tutorial Session • Romerike • ThC-29-02 Part A	**Technical Session • E-8 • ThC-36-04 Part A**	**Technical Session • E-6 • ThC-34-09**
	Session Organizer: **Francesca di Mare,** Ruhr-Univeritat Bochum	Session Organizer: **Tianyu Pan**, Duke University/Beihang University Session Co-Chair(s): **Caetano Peng**, Rolls-Royce plc.	Session Organizer: **Sung-Hwa Jeung,** Ingersoll Rand Session Co-Chair(s): **Martin J. Conlon,** Equispheres, Inc.
2:00	GT2018:77505 **A Free Energy Perspective on Homogeneous Nucleation Model** ***Satoru Yamamoto,*** *Tohoku Univ* GT2018:77500 **Numerical Simulation of Metastable Condensing Flow with Moment Method: Challenges and Opportunities** ***Matteo Pini,*** *Delft University of Technology* GT2018:77501 **Towards high-resolution unsteady simulations of condensing wet steam flows with an accurate thermodynamical description** ***Pascal Post****, Ruhr-Univeritat Bochum*	GT2018:75057 **Modeling strategies to obtain the forcing function for a forced response analysis** ***Stuart Connell,*** *General Electric Global Research;* ***Laith Zori****,* ***Sunil Patil****, ANSYS Inc*	GT2018:76224 **Experimental Force Coefficients for Two Sealed Ends Squeeze Film Dampers (Piston Rings and O-rings): An Assessment of Their Similarities and Differences** ***Luis San Andres, Bonjin Koo,*** *Texas A&M Univ;* ***Sung-Hwa Jeung****, Ingersoll Rand*
2:30	**TUTORIAL**	GT2018:75239 **Application of the Modal Approach for Prediction of Forced Response Amplitudes for Fan Blades** ***Franziska Eichner, Joachim Belz,*** *DLR - German Aerospace Center*	GT2018:76404 **Dynamic Properties of Water-Lubricated Double Clearance Squeeze Film Damper Supported by O-rings** ***Tadayoshi Shoyama****, Panasonic Corporation;* ***Koji Fujimoto****, The University of Tokyo*
3:00		GT2018:75390 **Experimental Validation of Forced Response Methods in a Multi-Stage Axial Turbine** ***Thomas Hauptmann,*** *Leibniz Universitat Hannover, Institute of Turbomachinery and Fluid Dynamics;* ***Christopher Meinzer****, Inst. of Turbomachinery & Fluid Dynamics;* ***Joerg Seume****, Gottfried Wilhelm Leibniz Universitaet*	GT2018:76308 **Hermetically Sealed Squeeze Film Damper for Operation in Oil-Free Environments** ***Bugra Ertas****, GE Global Research Center;* ***Adolfo Delgado****, Texas A&M University*

	STRUCTURES & DYNAMICS: ROTORDYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO_2 POWER CYCLES
	Rotordynamics I - Analysis	**Rotor-Stator Interaction**	**Supercritical CO2 Power Cycles Path Forward**
	Technical Session • E-7 • ThC-33-01 Part A	**Technical Session • Event Room • ThC-35-09**	**Panel Session • Nord-Norge • ThC-38-09 Part A**
	Session Organizer: **Almudena Vega**, SIEMENS Gamesa Session Co-Chair(s): **Mehdi Vahdati**, Imperial College London	Session Organizer: **Bogdan Epureanu**, University Of Michigan Session Co-Chair(s): **Weihan Tang**, Pratt & Whitney	Session Organizer: **Robin Ames**, DoE National Energy Technology Lab Session Co-Chair(s): **Eric Clementoni**, Bechtel Marine Propulsion Corporation
2:00	GT2018:75042 **Numerical Modeling of Thermally-Induced Vibration in Rotor Caused by Light-Rub against Brush Seal** ***Filippo Cangioli***, *Waukesha Bearings;* ***Paolo Pennacchi***, ***Steven Chatterton***, *Politecnico di Milano - Dept. of Mech. Eng.;* ***Andrea Vania***, *Politecnico di Milano*	GT2018:75824 **Thermo-Mechanical Modeling of Abradable Coating Wear in Aircraft Engines** *Florence Nyssen, Alain Batailly, Polytechnique Montreal*	GT2018:77599 **U.S. DOE Perspective on sCO2 Power Cycle Development** ***Richard Dennis***, *US Dept Of Energy* GT2018:77600 **Perspective on sCO2 Power Cycle Development for Indirect Fossil Applications** ***Doug Hofer***, *GE* GT2018:77601 **Perspective on sCO2 Power Cycle Development for Direct Fossil Applications** ***Carl Hustad***, *8rivers Capital, LLC*
2:30	GT2018:75347 **A Sobol' Sequence Parametric Analysis of Rotor Thermal Bow in Gas Turbines** ***Evan O. Smith, Jouke HS de Baar, A.J. Neely***, *University of New South Wales*	GT2018:75880 **Thermomechanical model reduction for efficient simulations of rotor-stator contact interaction** *Nicolas GUERIN, Patricio Almeida, Safran Helicopter Engines; Anders Thorin, Mathias Legrand, McGill University; Fabrice Thouverez, Laboratory of Tribology and Systems Dynamics*	P A N E L
3:00	GT2018:75948 **A SIMPLIFIED AND EFFICIENT ANALYSIS OF MORTON EFFECT** ***Lili Gu***, *Texas A&M University*	GT2018:75959 **Nonsmooth thermoelastic simulation of blade-casing contact interactions** ***Anders Thorin, Mathias Legrand***, *McGill University;* ***Nicolas GUERIN***, ***Patricio Almeida***, *Safran Helicopter Engines;* ***Fabrice Thouverez***, *Laboratory of Tribology and Systems Dynamics*	

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY
	Unsteady Flows and Transition	**Flow Separation, Loss and Boundary Layer Interaction Methods**	**Novel Methods for CFD**
	Technical Session • E-5 • ThC-41-06 Part A	**Technical Session • E-1 • ThC-42-24 Part A**	**Technical Session • E-3 • ThC-42-29 Part A**
	Session Organizer: **Choon S. Tan,** Massachusetts Institute of Technology	ession Organizer: **Kurt Weber**, Rolls-Royce Corp Tech Session Co-Chair(s): **Sami Girgis**, Pratt & Whitney	Session Organizer: **Sunil Patil**, ANSYS Inc Session Co-Chair(s): **Koen HILLEWAERT**, Cenaero
2:00	GT2018:75676 **Investigation of thermal effect on bypass transition on a high-pressure turbine guide vane** ***Tânia S. Cação Ferreira, Nikolaos Vasilakopoulos, Tony Arts,*** *Von Karman Inst*	GT2018:75624 **CORRELATIONS FOR THE PREDICTION OF INTERMITTENCY AND TURBULENT SPOT PRODUCTION RATE IN SEPARATED FLOWS** *Daniele Simoni, DIMSET University of Genova; Matteo Dellacasagrande, Pietro Zunino, Marina Ubaldi, Davide Lengani, Roberto Guida, University of Genova*	GT2018:76011 **Investigation of Spectral Vanishing Viscosity for Stabilizing and Accelerating Solution of Time Spectral Equation System** ***Hangkong Wu, Dingxi Wang, Xiuquan Huang, Hong Yan, Jianling Li,*** *Northwestern Polytechnical University*
2:30	GT2018:76174 **Detailed Analysis of Boundary Layer Control by Fluidic Oscillators on a highly loaded Profile** ***Julia Kurz, Reinhard Niehuis,*** *Universitaet der Bundeswehr Muenchen - Institute of Jet Propulsion*	GT2018:75792 **LES Investigation Of Boussinesq Constitutive Relation Validity In A Corner Separation Flow** ***Jean-Franτois Monie****r, Safran Aircraft Engines;* ***Nicolas Poujol, Mathieu Laurent, Jerome Boudet, Stephane AUBERT, Liang Shao,*** *Ecole Centrale de Lyon;* ***Feng Gao,*** *University of Surrey*	GT2018:76653 **Experimental and Numerical Characterization of Transonic Compressor Subjected to Inlet Distortion** ***Mark H. Ross, Andrew Oliva, Vicente Jerez Fidalgo,*** *Notre Dame Turbomachinery Laboratory;* ***William Holmes,*** *ANSYS Canada Ltd;* ***Laith Zori,*** *ANSYS Inc;* ***Ryan T. Kelly, Aleksandar Jemcov,*** *University of Notre Dame*
3:00	GT2018:76338 **LARGE EDDY SIMULATIONS OF SEPARATED BOUNDARY LAYER WITH PRESSURE GRADIENT AND HEAT TRANSFER** ***Yifei Wu,*** *Beihang University, Nanchang Hangkong University;* ***Weihao Zhang, Zhengping Zou, Jiang Chen,*** *Beihang University*	GT2018:77144 **Large-eddy simulation of corner separation in a compressor cascade** ***Byung-Young Min, Jongwook Joo, Jomar Mendoza, Guoping Xia, Jin Lee, Gorazd Medic,*** *United Technologies Research Center*	GT2018:76862 **Digital Geometry & Morphing to Support Analysis & Design** *Nabil Meah, Matthew Hunt, RO Evans, Tamas Racz, John Verdicchio, A Kudryavtsev, Cambridge Flow Solutions Ltd; Bill Dawes, Whittle Lab, Cambridge University Engineering Departm*ent

THURSDAY, JUNE 14 — 2:00 - 3:30 PM

	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY
	Axial Compressors, Propellers and Fans	**Centrifugal Compressors: Modelling**	**Research Panel Session**
	Technical Session • E-4 • ThC-46-04 Part A	**Technical Session • E-2 • ThC-44-05 Part A**	**Panel Session • Jan Mayen 1 • ThC-48-09 Part A**
	Session Organizer: **Stephane Hiernaux**, Safran Aero Boosters Session Co-Chair(s): **Swati Saxena**, ESI Group	Session Organizer: **Hideaki Tamaki**, IHI Corporation Session Co-Chair(s): **Friedrich Froehlig**, MTU Friedrichshafen Gmbh	Session Chair: **Alessandro Bianchini**, University of Florence
2:00	GT2018:75184 **Automated aerodynamic optimization of an aggressive s-shaped intermediate compressor duct** ***Thomas Stuerzebecher**, **Christian Voß**, German Aerospace Center DLR; **Georgios Goinis**, DLR; **Pieter Groth**, **Steffen Hammer**, GKN Aerospace Sweden AB; **Harsimar Sahota**, MTU Aero Engines AG*	GT2018:75919 **NUMERICAL INVESTIGATION OF THE CIRCUMFERENTIAL PRESSURE DISTORTION INDUCED BY A CENTRIFUGAL COMPRESSORÆS EXTERNAL VOLUTE** ***Thomas Ceyrowsky**, **Andre Hildebrandt**, MAN Diesel & Turbo SE; **Rüdiger Schwarze**, Technical University Bergakademie Freiberg*	GT2018:77627 **Wind Energy Research at Texas A&M** ***Yu Ding**, Texas A&M University* GT2018:77628 **Wind Energy Research at University of Firenze** ***Alessandro Bianchini**, University of Florence*
2:30	GT2018:75372 **A Machine Learning based Approach of Performance Estimation for High-Pressure Compressor Airfoils** ***Jonas Marx**, **Stefan Gantner**, **Jörn Städing**, MTU Maintenance GmbH; **Jens Friedrichs**, TU Braunschweig Inst of Aircraft Propulsion & Turbomachinery*	GT2018:76967 **Analytical and Experimental Results of a Novel Single-Stage Centrifugal Compressor with Economizer Injection** ***William Cousins**, **Lei Yu**, United Technologies Research Center; **Vishnu Sishtla**, **Feng Shen**, United Technologies Research Center*	**P** **A** **N** **E** **L**
3:00	GT2018:76816 **Robust Multiphysics Optimization For Fan Blade Aerodynamic Efficiency, Structural Properties And Flutter Sensitivity** ***Kirill Vinogradov**, **Gennady Kretinin**, **Igor Leshchenko**, **Konstantin Fedechkin**, **Kseniia Otriakhina**, **Olga Vinogradova**, **Vyacheslav Bushmanov**, **Roman Khramin**, PJSC UEC-Saturn*	GT2018:75097 **The interaction between inlet guide vanes and the impeller recirculating flow in a centrifugal compressor and the resulting impact on flow range** ***Xiangjun Li**, **Yanhui Wu**, Northwestern Polytechnical University; **Stephen Spence**, Queens University of Belfast*	

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	AIRCRAFT ENGINE	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS
	Thermal Management Systems and Aero-engine Oil Systems	**Pressure Gain Combustion**	**Combustor Design & Development I**
	Technical Session • Jan Mayen 2 • ThD-1-04 Part B	**Panel Session • Jan Mayen 3 • ThD-4-35 Part B**	**Technical Session • A1-1 • ThD-4-04 Part B**
	Session Organizer: **Michael Flouros,** MTU Aero Engines AG Session Co-Chair(s): **Aaron Byerley**, United States Air Force Academy	Session Organizer: **Ajay Agrawal**, University of Alabama	Session Organizer: **Michael Duesing**, Ansaldo Energia Session Co-Chair(s): **Jenny Larfeldt**, Siemens Industrial Turbomachinery AB
4:00	GT2018:76371 **Investigation of Oil Jet Impingement on a Rotating Gear using Lattice Boltzman Method (LBM)** ***Stephen Ambrose, Herve Morvan, Kathy Simmons**, The University of Nottingham*	GT2018:77566 **U.S. DOE Program in Pressure Gain Combustion for Stationary Power Generation** ***Richard Dennis**, US Dept Of Energy* GT2018:77568 **Pressure Gain Combustion Research at General Electric** ***Anthony Dean,** General Electric Global Research Center* GT2018:77623 **Application of the Continuously Rotating Detonation to Gas Turbines** ***Piotr Wolanski**, Warsaw University of Technology*	GT2018:77164 **Expanding Fuel flexibility in MHPS' Dry Low NOx Combustor** ***Katsuyoshi Tada**, MITSUBISHI HEAVY INDUSTRIES,LTD.; **Kei Inoue**, Mitsubishi Heavy Industries, LTD.; **Tomo Kawakami**, Mitsubishi Hitachi Power Systems, Ltd.* ***Keijiro Saitoh**, Mitsubishi Heavy Industries, Ltd.* ***Satoshi Tanimura**, Mitsubishi Hitachi Power Systems, Ltd.*
4:30	GT2018:77130 **Multiphase CFD Modeling of External Oil Flow from a Journal Bearing** ***Martin Berthold, Herve Morvan, Richard J Jefferson-Loveday, Benjamin C Rothwell,** University of Nottingham; Colin Young, Rolls-Royce plc*	**P A N E L**	GT2018:75165 **An assessment on the benefits of additive manufacturing regarding new swirler geometries for gas turbine burners** ***Fabrice L.M. Giuliani, Nina Paulitsch,** COMBUSTION BAY ONE e.U; **Daniele Cozzi**, **Michael Goertler**, JOANNEUM RESEARCH Forschungsgesellschaft mbH / MATERIALS; **Lukas Andracher**, FH Joanneum GmbH - Institute of Aviation*
5:00	GT2018:75851 **Heat Generation in a Main-Shaft Turbine Aero-Engine Bearing Considering Metal and Ceramic Rolling Elements** ***Brian D. Nicholson, Jeremy T. Nickell,** Air Force Research Lab*		

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	CYCLE INNOVATIONS	ELECTRIC POWER	HEAT TRANSFER: ADDITIVE MANUFACTURING
	Fuel Cell Driven Cycles	**Gas Turbine Industry Update**	**Additive Manufacturing II**
	Technical Session • Hordaland • ThD-6-01	**Panel Session • A1-6 • ThD-8-06**	**Technical Session • A1-4 + A1-5 • ThD-21-02**
	Session Organizer: **Tong-seop Kim**, Inha University Session Co-Chair(s): **Jeong Lak Sohn,** Korea Institute of Machinery & Materials	Session Organizer: **Seyfettin Can Gulen**, Bechtel Infrastructure & Power Inc.	Session Organizer: **Antonio Andreini**, University of Florence Session Co-Chair(s): **Michael Benson**, US Military Academy
4:00	GT2018:75026 **Design and Emulation of a Turbocharged Bio-Fuelled SOFC Plant** ***Mario Luigi Ferrari, Marco De Campo, Loredana Magistri**, University of Genoa*	GT2018:77542 **Regulatory and Legislative Updates** ***Andrew Dicke**, GE Energy* GT2018:77543 **Power Generation Fuel Landscape** ***Peter Baldwin**, Base E* GT2018:77544 **Novel Cycles in Power Generation** ***Richard Dennis**, US Dept Of Energy* GT2018:77546 **MGT Gas Turbine Update: Clean and Efficient Gas Turbines** ***Sven Hendrik Wiers**, Man Turbo Ag*	GT2018:75429 **Numerical Optimization, Characterization, and Experimental Investigation of Additively Manufactured Communicating Microchannels** ***Kathryn Kirsch, Karen Thole**, Penn State University*
4:30	GT2018:76014 **Performance enhancement of a molten carbonate fuel cell/ micro gas turbine hybrid system with carbon capture by off-gas recirculation** ***Ji Ho Ahn, Ji Hun Jeong, Tong-seop Kim,** Inha University*	**P A N E L**	GT2018:77287 **Effect of Coolant Feed Direction on Additively Manufactured Film Cooling Holes** ***Curtis Stimpson, Jacob Snyder, Karen Thole**, Penn State University; **Dominic Mongillo**, Pratt & Whitney*
5:00	GT2018:76754 **Turbocharger Based Hybrid System Modeling and Validation of a Free Spool Subject to Compressor Surge** ***Alessio Abrassi, Alberto Traverso**, Univ Of Genova; **Lorenzo Ferrari**, University of Pisa - DESTEC*		GT2018:77114 **Adiabatic Film Cooling Effectiveness of a LAM-Fabricated Porous Leading Edge Segment of a Turbine Blade** ***Luisana Calderon, Andres Curbelo, Gaurav Gupta, Jayanta Kapat**, University of Central Florida*

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)	INDUSTRIAL & COGENERATION
	Methods and Analysis for Film Cooling	**Rotor Cavities**	**Design and Evaluation Considerations of Waste Heat Recovery Technologies**
	Technical Session • A1-3 • ThD-19-07 Part B	**Technical Session • A1-2 • ThD-15-08 Part B**	**Tutorial Session • Akershus • ThD-23-09 Part B**
	Session Organizer: **Paul Giel**, VPL at NASA Glenn Session Co-Chair(s): **Eric Ruggiero**, GE Aviation	Session Organizer: **Dr. Alexander V. Mirzamoghadam**, Honeywell Aerospace Session Co-Chair(s): **James Scobie**, University of Bath	Session Organizer: **Leonid Moroz**, Softinway Inc. Session Co-Chair(s): **Clement Joly,** SoftInWay; **Abdul Nassar**, Softinway Turbomachinery Solutions Pvt Ltd
4:00	GT2018:77170 **Experimental Measurements of Heat Transfer Coefficient Augmentation Due To Approach Flow Effects** ***Joshua Anderson,*** *The University of Texas;* ***David Bogard****, University of Texas At Austin;* ***Thomas Dyson****, GE Global Research;* ***Zachary Webster****, GE Aviation*	GT2018:75111 **Large-eddy simulation of buoyancy-induced flow in a sealed rotating cavity** ***Diogo B. Pitz, John Chew, Olaf Marxen****, University of Surrey*	GT2018:77597 **Design and Evaluation Considerations of Waste Heat Recovery Technologies** ***Clement Joly****,* ***Leonid Moroz****, Softinway Inc;* ***Abdul Nassar****, Softinway Turbomachinery Solutions Pvt Ltd*
4:30	GT2018:75411 **Volumetric velocimetry measurements of film cooling jets** ***Artur Joao Carvalho Figueiredo, Robin Jones, Oliver Pountney, James Scobie, G.D. Lock, Carl Sangan, David Cleaver****, University of Bath*	GT2018:76832 **Very-Large Eddy Simulations of disk heat transfer in a rotating cavity using Lattice-Boltzmann Method** ***Junya Kouwa, Yoshiyuki Iso****, IHI Corporation;* ***Francesco Polidoro****,* ***Sebastien Gautier****, Exa Corp*	**T U T O R I A L**
5:00	GT2018:76458 **High-speed velocity measurements of film cooling applications at high-turbulence main flow conditions** ***Michael Straußwald, Tobias Sander, Amirabas Bakhtiari****,* ***Michael Pfitzner****, Bundeswehr University Munich*		

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	MANUFACTURING MATERIALS & METALLURGY	MICROTURBINES, TURBOCHARGERS & SMALL TURBOMACHINES	OIL & GAS APPLICATIONS
	Superalloys and Advances thereof	**Turbochargers - Performance & Systems**	**MRO/Digital**
	Technical Session • Svalbard • ThD-24-07	**Technical Session • Oslo • ThD-26-06**	**Technical Session • Sør-Norge• ThD-27-06**
	Session Organizer: **Xiao Huang**, Carleton University Session Co-Chair(s): **Pontus Slottner**, Siemens Indus	Session Organizer: **Harold Sun,** FiTech Session Co-Chair(s): **Yoshikiyo Watanabe**, TOYOTA INDUSTRIES CORPORATION	Session Organizer: **Timothy Allison**, Southwest Research Institute Session Co-Chair(s): **Seth Lawson**, US Department of Energy
4:00	GT2018:75207 **Machine learning for alloy composition and process optimization** ***Julia Ling, Erin Antono, Saurabh Bajaj, Sean Paradiso, Maxwell Hutchinson, Bryce Meredig,*** *Citrine Informatics;* ***Brenna Gibbons****, Stanford University*	GT2018:75386 **Experimental Investigation of an Inverted Brayton Cycle for Exhaust Gas Energy Recovery** ***Ian Kennedy, Zhihang Chen, Colin Copeland,*** *University of Bath;* ***Bob Ceen****, Axes Design Ltd;* ***Simon Jones****, Hieta Technologies Ltd*	GT2018:76583 **Digital Compressor Analytics** ***Martin Bakken, Lars Eirik Bakken****, Norwegian University of Science and Technology;* ***Erling Lunde****, Statoil ASA*
4:30	GT2018:75588 **Mandrel-free hot-spinning for large size titanium alloy plate** ***Yoshihide Imamura, Ken Ikawa, Kojiro Motoyama, Hayato Iwasaki, Takeo Hirakawa,*** *Kawasaki Heavy Industries, Ltd;* ***Hiroshi Utsunomiya****, Osaka University*	GT2018:76470 **ANALYSIS OF UNSTEADY ENERGY FLUXES IN A TURBOCHARGER BY USING A HOLISTIC MODEL EXTRAPOLATING STANDARD LOOKUP TABLES IN FULL ENGINE OPERATING MAP** ***Jose Ramon Serrano, Luis Miguel Garcia Cuevas,*** *Universitat Politecnica de Valencia;* ***Lukas Benjamin Inhestern****, CMT/ Universitat Politecnica De Valencia;* ***Stephane Guilain, Hadi Tartoussi****, Renault*	GT2018:76849 **Use of operating parameters, digital replicas and models for condition monitoring and improved equipment health** ***Stefano Cioncolini, Carmine Allegorico, Ilaria Parrella, Fausto Carlevaro, Marzia Sepe, Laura De Stefanis, Mariagrazia Mastroianni,*** *BHGE;* ***Ernesto Escobedo****, GEIQ*
5:00	GT2018:77224 **Microstructure and Thermomechanical Fatigue Behaviour of Directionally Solidified Ni-based Superalloys in OP Condition** ***Dongyi Seo****, National Research Council Canada;* ***Seong-Moon Seo, Young-Soo Yoo,*** *Korea Institute of Materials Science;* ***Daejin Kim****, Andong National University*		GT2018:75876 **Demonstration of Bleed Air Recirculation System to Improve Part Load Efficiency of Solar Mars 100 DLE Industrial Gas Turbine** ***Luke Cowell, Simon Reynolds, Timothy Caron, Donghui Zhang****, Solar Turbines Inc.*

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	STEAM TURBINES	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
	Steam Turbines Tutorial	**Forced Response I**	**Fluid Film Bearings 4**
	Tutorial Session • Romerike • ThD-29-02 Part B	Technical Session • E-8 • ThD-36-04 Part B	Technical Session • E-6 • ThD-34-04
	Session Organizer: **Francesca di Mare**, Ruhr-Univeritat Bochum	Session Organizer: **Tianyu Pan**, Duke University/Beihang University Session Co-Chair(s): **Caetano Peng**, Rolls-Royce plc	Session Organizer: **Aaron Rimpel**, Southwest Research Institute Session Co-Chair(s): **Adolfo Delgado**, Texas A&M University
4:00	GT2018:77502 **Aeroelasticity in the context of condensing wet steam flows – Introduction** ***Derek Micallef**, Ruhr-Universität Bochum* GT2018-77644 **Aeroelasticity in the context of condensing wet steam flows - Case study** ***Christopher Fuhrer**, University of Stuttgart* GT2018-77604 **Experimental Investigation of Droplet Laden Flow Around Blade Profiles** ***Franz Joos**, Helmut Schmidt University* GT2018-77605 **The Development of Measurement Techniques for Fine and Coarse Water Droplets in Wet Steam Turbine** ***Xiaoshu Cai**, University of Shanghai*	GT2018:76220 **Coupled Fluid Structure Simulation Method in the Frequency Domain for Turbomachinery Applications** ***Christian Berthold**, **Christian Frey**, German Aerospace Center (DLR); **Harald Schoenenborn**, MTU Aero Engines AG*	GT2018:75256 **Tilting-pad journal bearing in hybrid operation - a numerical and experimental investigation** ***Nico Buchhorn**, **Sebastian Kukla**, **Beate Bender**, **Marc Neumann**, Ruhr-University Bochum*
4:30	**T U T O R I A L**	GT2018:76814 **Prediction of aerodynamically induced blade vibrations in a radial turbine rotor using a Nonlinear Harmonic approach** ***Nikola Kovachev**, **Christian U. Waldherr**, **J. F. Mayer**, **Damian Vogt**, University of Stuttgart*	GT2018:75335 **STATIC AND DYNAMIC COEFFICIENT MEASUREMENTS FOR A THRUST COLLAR USED IN AN INTEGRALLY GEARED COMPRESSOR** ***Thomas Kerr**, **Andrew Crandall**, **Dara Childs**, **Adolfo Delgado**, Texas A&M University*
5:00		GT2018:77056 **An Approach to Approximate the Full Strain Field of Turbofan Blades During Operation** ***Gen Fu**, **Alexandrina Untaroiu**, **Walter Obrien**, Virginia Tech.*	GT2018:75888 **Numerical Investigation for Characteristics and Oil-Air Distributions of Oil Film In A Tilting-Pad Journal Bearing** ***Aoshuang Ding**, **Yaobing Xiao**, Tsinghua University*

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS	STRUCTURES & DYNAMICS: ROTORDYNAMICS	SUPERCRITICAL CO_2 POWER CYCLES
	Probabilistic Methods Fundamentals 2	**Rotordynamics I - Analysis**	**Supercritical CO2 Power Cycles Path Forward**
	Tutorial Session • Event Room • ThD-32-05	**Technical Session • E-7 • ThD-33-01 Part B**	**Panel Session • Nord-Norge • ThD-38-09 Part B**
	Session Organizer: **Kai Kadau**, Siemens	Session Organizer: **Almudena Vega,** Siemens Gamesa Session Co-Chair(s): **Mehdi Vahdati,** Imperial College London	Session Organizer: **Robin Ames**, DoE National Energy Technology Lab Session Co-Chair(s): **Eric Clementoni**, Bechtel Marine Propulsion Corporation
4:00	GT2018:77444 **Industry Challenges in Uncertainty Quantification: Bridging the Gap Between Simulation and Test** ***Mark Andrews***, ***Peter Chien***, *SmartUQ*	GT2018:76017 **Evaluation of friction models for rotor-rubbing predictions** ***Juan Jauregui***, ***Claudia Gonzalez***, *UNIVERSIDAD AUTONOMA DE QUERETARO;* ***Jorge Saenz***, *GE Aviation*	GT2018:77602 **Perspective on sCO2 Power Cycle Development for CSP Applications** ***Karl Wygant***, *Hanwha Power Systems* GT2018:77603 **Perspective on sCO2 Power Cycle Development for Nuclear Applications** ***Jeong Ik Lee***, *Korea Advanced Institute of Science and Technology (KAIST)* GT2018:77607 **Application of sCO Power Cycles for Distributed Generation** ***David Stapp***, *Peregrine Turbine Technologies*
4:30	**T U T O R I A L**	GT2018:76392 **Dynamic Model Development and Analysis of Multiple Rotors Coupled with Thrust Collars** ***Kyungdae Kang***, *Hanwha Techwin*	**P A N E L**
5:00		GT2018:76481 **A MODAL BASED APPROACH FOR THE LATERAL DYNAMIC ANALYSIS OF ROTATING SHAFTS SUPPORTED BY ELASTIC SUBSTRUCTURES** ***Flavio Quattrone***, ***Benjamin Dugone***, *Ansaldo Energia Switzerland AG*	

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	TURBOMACHINERY: AXIAL FLOW TURBINE AERODYNAMICS	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY
	Unsteady Flows and Transition	**Flow Separation, Loss and Boundary Layer Interaction Methods**	**Novel Methods for CFD**
	Technical Session • E-5 • ThD-41-06 Part B	**Technical Session • E-1 • ThD-42-24 Part B**	**Technical Session • E-3 • ThD-42-29 Part B**
	Session Organizer: **Choon S. Tan,** Massachusetts Institute of Technology	Session Organizer: **Kurt Weber**, Rolls-Royce Corp Tech Session Co-Chair(s): **Sami Girgis**, Pratt & Whitney	Session Organizer: **Sunil Patil**, ANSYS Inc Session Co-Chair(s): **Koen HILLEWAERT**, Cenaero
4:00	GT2018:77120 **An Implicit-LES Simulation of Variable-Speed Power Turbine Cascade for Low Free-Stream Turbulence Conditions** ***Ali Ameri**, Ohio State University*	GT2018:76828 **Computational Fluid Dynamics Simulations of Windage Loss in a Spur Gear** ***Murat Aktas**, TOBB University of Economics & Technology; **Mehmet Ali Yavuz**, **Ali Kivanc** Ersan, TAI*	GT2018:76182 **CFD Study Exploring Jet Configurations And Jet Pulsing For An Aeroengine Scoop-Based Oil Delivery System** ***Kathy Simmons**, **Evgenia Korsukova**, **Paloma Paleo Cageao**, The University of Nottingham; **Luke Harrison**, Rolls Royce plc*
4:30	GT2018:75541 **Surface Roughness Impact on Secondary Flow and Losses in a Turbine Exhaust Casing** ***Isak Jonsson**, **Valery Chernoray**, **Borja Rojo**, Chalmers University Of Technology*	GT2018:77125 **Accurate Prediction of Loss Using High Fidelity Methods** ***Pawel J Przytarski**, **Andrew P S Wheeler**, University of Cambridge*	GT2018:75942 **Capturing Radial Mixing in Axial Compressors with CFD** ***Lorenzo Cozzi**, **Filippo Rubechini**, **Matteo Giovannini**, **Michele Marconcini**, **Andrea Arnone**, University Of Florence; **Andrea Schneider**, **Pio Astrua**, Ansaldo Energia*
5:00	GT2018:75707 **The Role of Vortex Shedding in the Trailing Edge Loss of Transonic Turbine Blades** ***Andrew Melzer**, **Graham Pullan**, University of Cambridge, Whittle Laboratory*	GT2018:76223 **Numerical Investigation of Non-Isothermal Cavitating Flows on Hydrofoils by means of an Extended Schnerr-Sauer Model coupled with a Nucleation Model** ***Maria Grazia De Giorgi**, Donato Fontanarosa, Dept. of Engineering for Innovation/University of Salento; **Antonio Ficarella**, University of Salento*	GT2018:75982 **Scale-Resolving Simulations of Low-Pressure Turbine Cascades with Wall Roughness Using a Spectral-Element Method** ***Anirban Garai**, **Laslo Diosady**, Science and Technology Corporation; **Scott Murman**, **Nateri K., Madavan**, NASA Ames Research Center*

THURSDAY, JUNE 14 — 4:00 - 5:30 PM

	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS	WIND ENERGY
	Axial Compressors, Propellers and Fans	**Centrifugal Compressors: Modelling**	**Research Panel Session**
	Technical Session • E-4 • ThD-46-04 Part B	**Technical Session • E-2 • ThD-44-05 Part B**	**Panel Session • Jan Mayen 1 • ThD-48-09 Part B**
	Session Organizer: **Stephane Hiernaux**, Safran Aero Boosters Session Co-Chair(s): **Swati Saxena**, ESI Group	Session Organizer: **Hideaki Tamaki**, IHI Corporation Session Co-Chair(s): **Friedrich Froehlig**, MTU Friedrichshafen Gmbh	Session Organizer: **Alessandro Bianchini**, University of Florence
4:00	GT2018:76445 **Reproducing Existing Nacelle Geometries With the Free-Form Deformation Parametrization** ***Konstantin Rusch, Martin Siggel, Richard-Gregor Becker**, German Aerospace Center (DLR)*	GT2018:75024 **Design of a transonic high flow coefficient centrifugal compressor by using advanced design methods** ***David Wittrock, Oliver Reutter, Thomas Schmidt, Eberhard Nicke**, DLR German Aerospace Center; **Jan Klausmann**, MAN Diesel & Turbo SE*	GT2018: 77629 **Wind Energy Research at TU Berlin** ***Christian Oliver Paschereit**, H.F.I TU Berlin* GT2018:77630 **The Research Experience of H2020 Research Project** ***Georgios Pechlivanoglou**, Eunice Energy Group*
4:30	GT2018:76732 **Novel Shape Parametrization Technique Applied to the Optimization of a Supersonic ORC Turbine Cascade** ***Alessandro Romei**, **Giacomo Persico**, Politecnico Di Milano*	GT2018:75324 **A Three-Zone Modelling Approach for Centrifugal Compressor Slip Factor Prediction** ***Charles Stuart, Stephen Spence, Sung in Kim**, Queen's University Belfast; **Dietmar Filsinger, Andre Starke**, IHI Charging Systems International Gmbh*	**P** **A** **N** **E** **L**
5:00		GT2018:76154 **1D and 3D- Design Strategies for Pressure slope Range Optimization of High-Flow Transonic Centrifugal Compressor Impellers** ***Andre Hildebrandt**, **Thomas Ceyrowsky**, MAN Diesel & Turbo SE*	

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	AIRCRAFT ENGINE	CERAMICS	COMBUSTION, FUELS & EMISSIONS
	Radical Concepts to Reduce CO_2 Emissions	**Ceramic Matrix Composites: Testing and Modeling - III**	**Combustion Modeling III**
	Panel Session • Jan Mayen 2 • FA-1-10	**Technical Session • Oslo • FA-2-03**	**Technical Session • Jan Mayen 3 • FA-4-02**
	Session Organizer: **Tomas Grönstedt**, Chalmers University Session Co-Chair(s): **Anders Lundbladh,** GKN Aerospace	Session Organizer: **Rajesh Kumar**, United Technologies Research Ctr Session Co-Chair(s): **Sai Sarva**, GE Global Research; **Jun Shi**, Rolls-Royce Corporation	Session Organizer: **Samir Rida**, Honeywell Aerospace Session Co-Chair(s): **Michael Pfitzner**, UniBW Muchen
8:00	GT2018-77640 **Progress on Open Rotor solution towards ACARE CO_2 goal** ***Olivier Penanhoat**, Snecma* GT2018-77641 **Prospects of LNG in Aviation** ***Arvind Gangoli Rao**, Technical University of Delft* GT2018-77642 **Radical propulsion concepts and the ULTIMATE project** ***Tomas Grönstedt**, Chalmers University* GT2018-77643 **CO_2-free Air Transport** ***Andrew Rolt**, Centre for Propulsion Engineering, Cranfield University*	GT2018:75852 **Life-limiting Behavior of an Oxide/Oxide Ceramic Matrix Composite at Elevated Temperature Subject to Foreign Object Damage** ***Michael J. Presby**, NAVAIR; **Nesredin Kedir**, **Luis J. Sanchez**, **D. Calvin Faucett**, **Sung Choi**, Naval Air Systems Command; **Gregory Morscher**, The University of Akron*	GT2018:75329 **CFD–LED DESIGNS OF PRE-FILMING INJECTORS FOR GAS-TURBINE COMBUSTORS** ***Kumud Ajmani**, Vantage Partners, LLC; **Phil Lee**, Woodward FST, Inc; **Hukam Mongia**, CSTI Associates, LLC; **Kathleen M Tacina**, NASA Glenn Research Center*
8:30		GT2018:76835 **Constituent Development for Higher-Temperature Capable Ceramic Matrix Composites** ***Michael Cinibulk**, Air Force Research Laboratory; **Zlatomir Apostolov**, AFRL; **Emmanuel Boakye**, **Thomas Key**, **Derek King**, UES, Inc.*	GT2018:76216 **SIMULATION OF GAS TURBINE IGNITION USING LARGE EDDY SIMULATION APPROACH** ***Yihao Tang**, **Malik Hassanaly**, **Venkat Raman**, University of Michigan; **Brandon A. Sforzo**, Argonne National Laboratory; **Sheng Wei**, **Jerry M. Seitzman**, Georgia Institute of Technology*
9:00	**P A N E L**	GT2018:77133 **Crack Growth Resistance of Ceramic Matrix Composites and Anisotropic Stiffness Prediction/Measurement** ***Frank Abdi**, **Cody Godines**, **Saber DorMohammadi**, **Jalees Ahmad**, AlphaSTAR Corporation; **Gregory Morscher**, **Rabih Mansour**, The University of Akron; **Sung Choi**, Naval Air Systems Command*	GT2018:75337 **UNCERTAINTY QUANTIFICATION OF NOX EMISSION DUE TO OPERATING CONDITIONS AND CHEMICAL KINETIC PARAMETERS IN A PREMIXED BURNER** ***Sajjad Yousefian**, **Rory Monaghan**, National University of Ireland, Galway; **Gilles Bourque**, Siemens Canada*
9:30		GT2018:77147 **DEVELOPMENT OF ASTM TEST STANDARDS FOR THE MODE I INTERLAMINAR CRACK GROWTH RESISTANCE (GIC) OF CERAMIC MATRIX COMPOSITES** ***Frank Abdi**, **Jalees Ahmad**, **Cody Godines**, **Saber DorMohammadi**, AlphaSTAR Corporation; **Stephen Gonczy**, Gateway Material Technology; **Gregory Morscher**, **Rabih Mansour**, The University of Akron; **Sung Choi**, Naval Air Systems Command; **Jun Shi**, Rolls-Royce Corporation; **Greg Ojard**, United Technologies Research Center*	

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	HEAT TRANSFER: COMBUSTORS (WITH COMBUSTION, FUELS & EMISSIONS)
	Combustion Dynamics: Damping & Control II	**Jet-in-Crossflow & Swirling Flows I**	**Combustor - Turbine Interaction**
	Technical Session • A1-1 • FA-4-22	**Technical Session • Jan Mayen 1 • FA-4-30**	**Technical Session • A1-4 + A1-5 • FA-17-02**
	Session Organizer: **Joseph Meadows**, Virginia tech Session Co-Chair(s): **Fei Han**, GE Global Research Center	Session Organizer: **Antonio Andreini**, University of Florence	Session Organizer: **Uwe Ruedel**, Ansaldo Energia Switzerland Session Co-Chair(s): **Stephen Lynch**, Penn State University
8:00	GT2018:75406 **Thermoacoustic Instability Model with Porous Media: Linear Stability Analysis and the Impact of Porous Media** ***Cody Dowd*, *Joseph Meadows***, *Virginia Tech*	GT2018:75818 **Emulsion Jet in Crossflow Atomization Characteristics and Dynamics** ***Scott Leask*, *UCI Combustion Laboratory*; *Vincent McDonell*, *Scott Samuelsen*, *University Of California***	GT2018:75018 **Numerical Investigation of Fluid Flow and Heat Transfer in a Combustor Simulator** ***Darioush Gohari Barhaghi*, *Lars Hedlund*, *Siemens Industrial Turbomachinery AB***
8:30	GT2018:75837 **Acoustic properties of perforated liners with perpendicular arrangements of narrow slots** ***François-Xavier Jetté*, *Megan Schaenzer*, *Minh Quan Pham*, *Genevieve Bourgeois*, *Mehran Farhangi*, *Fabian Sanchez*, *Matt Innes*, *Ali Shanian*, *Siemens Canada Limited***	GT2018:77115 **Large eddy simulation of a premixed flame in hot vitiated crossflow with analytically reduced chemistry** ***Oliver Schulz*, *Nicolas Noiray*, *ETH Zurich***	GT2018:75392 **Computational Analysis of an Additively Manufactured Cooled Ultra Compact Combustor Vane** ***Kevin J. DeMarco*, *Brian T. Bohan*, *James L. Rutledge*, *Air Force Institute of Technology*; *Marc D. Polanka*, *AFIT/ENY*; *Pejman Akbari*, *California State Polytechnic University***
9:00	GT2018:75472 **Open-loop Control of the Precessing Vortex Core in a Swirl-Stabilized Combustor: Impact on Flame Shape and Flame Stability** ***Finn Lücko*, *Kilian Oberleithner*, *Chair of Fluid Dynamics, TU Berlin*; *Moritz Sieber*, *Technische Universitat Berlin***	GT2018:77193 **Experimental results on a gaseous jet into a turbulent air crossflow-Effect of the shape of injector inlet on fuel/air mixing** ***Jinkwan Song*, *Jong Guen Lee*, *University of Cincinnati***	GT2018:75921 **Impact of predicted combustor outlet conditions on the aerothermal performance of film-cooled HPT vanes** ***Simone Cubeda*, *Lorenzo Mazzei*, *Tommaso Bacci*, *Antonio Andreini*, *University of Florence***
9:30	GT2018:75531 **Synchronization of thermoacoustic modes in sequential combustors** ***Giacomo Bonciolini*, *Nicolas Noiray*, *ETH Zurich***	GT2018:77155 **THE EFFECT OF STRATIFICATION RATIO ON THE MACROSTRUCTURE OF STRATIFIED SWIRL FLAMES: EXPERIMENTAL AND NUMERICAL STUDY** ***Xiao Han*, *Yuzhen Lin*, *Beihang University*; *Davide Laera*, *Aimee S. Morgans*, *Imperial College London*; *Chih Jen Sung*, *University of Connecticut***	GT2018:76728 **Flow Field and Hot Streak Migration through High Pressure Cooled Vanes with representative Lean Burn Combustor Outflow** ***Tommaso Bacci*, *Tommaso Lenzi*, *Alessio Picchi*, *Lorenzo Mazzei*, *Bruno Facchini*, *University of Florence***

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: EXPERIMENTAL INTERNAL COOLING	HEAT TRANSFER: INTERNAL AIR SYSTEMS & SEALS (WITH TURBOMACHINERY)
	Tip and Trailing Edge Cooling	**Cooling System Designs**	**Labyrinth Seals**
	Technical Session • A1-3 • FA-19-06	**Technical Session • A1-2 • FA-16-04**	**Technical Session • A1-6 • FA-15-03**
	Session Organizer: **Qiang Zhang**, City University of London Session Co-Chair(s): **Chao Zhou**, Peking University	Session Organizer: **Jae Su Kwak**, Korea Aerospace University Session Co-Chair(s): **Dong-Ho Rhee**, Korea Aerospace Research Institute	Session Organizer: **Jens Fridh**, KTH Royal Institute of Technology Session Co-Chair(s): **James Scobie**, University of Bath
8:00	GT2018:75377 **EFFECT OF SHELF SQUEALER TIP CONFIGURATIONS ON FILM COOLING EFFECTIVENESS** ***JeongJu Kim, Minho Bang, Seonho Kim, Seok Min Choi, Hyung Hee Cho**, Yonsei University; **Wonjik Seo**, Korea Airforce*	GT2018:75715 **An experimental investigation on internal flow characteristics in a realistic and entire coolant channel with ribs and film holes** ***peng wang, Jian Pu, Ren-bin Yu**, University of Science and Technology of China; **Jianhua Wang**, University of Science & Technology; **shu-qing tian, Bo Wan, Jian-xia Luo**, Aero Engine Corporation of China (AECC)*	GT2018:75147 **Effects of Mushroom-Shaped Tooth Wear on the Leakage Performance and Rotordynamic Coefficients of Labyrinth Seals** ***Yaoxing CHEN, ZHIGANG LI, Xin YAN, Jun Li**, Institute of Turbomachinery, Xi'an Jiaotong Univ.*
8:30	GT2018:75911 **Heat transfer coefficient and film cooling effectiveness on the partial cavity tip of a gas turbine blade** ***Jin Young Jeong, Woobin Kim, Jae Su Kwak**, Korea Aerospace University; **Jung Shin Park**, Doosan Heavy Industries & Construction*	GT2018:76999 **Heat Transfer In A Rotating Two-Pass Rectangular Channel Featuring Reduced Cross-Sectional Area After Tip Turn (AR=4:1 To 2:1) With Profiled 60 Deg Angled Ribs** ***Andrew F Chen, Chao-Cheng Shiau, Je-Chin Han**, Texas A&M Univ; **Robert Krewinkel**, MAN Diesel & Turbo SE*	GT2018:75349 **Influence of hole-pattern stator on leakage performance of labyrinth seals** ***Xin YAN, Xinbo dai, Kang Zhang, Jun Li, Kun He**, Xi'an Jiaotong University*
9:00	GT2018:76207 **An Experimental Investigation of Adiabatic Film Cooling Effectiveness and Heat Transfer Coefficient on a Transonic Squealer Tip** ***Andrew J. Saul, Peter Ireland, Tsun Holt Wong**, University of Oxford; **John D. Coull**, University of Cambridge; **Haidong Li, Eduardo Romero**, Rolls Royce*	GT2018:77217 **Thermal Performance of the Realistic Leading Edge Cooling Passage of a Turbine Blade** ***INHWAN SONG, Changmin Son, Jangsik Yang**, Pusan National University; **Changyong lee, Kidon Lee**, Doosan Heavy Industries and Construction*	GT2018:75387 **Optimization Of The Straight Through Labyrinth Seal With Smooth Land** ***Wlodzimierz Wroblewski, Daniel Fraczek, Artur Szymanski, Krzysztof Bochon, Slawomir Dykas**, Silesian University of Technology; **Krzysztof Marugi**, Avio Aero*
9:30	GT2018:76710 **Film Cooling Characteristics of a High Lift Blade including Tip and Platform Flow Interactions** ***Shailendra Naik, Andreas Lerch**, Ansaldo Energia Switzerland*	GT2018:77218 **Full Surface Heat Transfer Measurement of a Turbine Internal Cooling System using a Large Scaled Model** ***Nojin Park, Changmin Son, Jangsik Yang**, Pusan National University; Changyong lee, **Kidon Lee**, Doosan Heavy Industries and Construction*	GT2018:75455 **CFD Leakage Predictions of Labyrinth Seals having Straight and Inclined Notched teeth with staggered Honeycomb land** ***Hasham Chougule, Dr. Alexander V. Mirzamoghadam**, Honeywell Aerospace*

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	INDUSTRIAL & COGENERATION	MANUFACTURING MATERIALS & METALLURGY	OIL & GAS APPLICATIONS
	Co-Generation Power Plant Performance, Operation and Maintenance	**Brazing (Narrow Gap and Diffusion Brazing) of SuperAlloys**	**Oil and Gas Applications**
	Technical Session • Nord-Norge • FA-23-03	**Discussion Session • Svalbard • FA-24-16**	**Tutorial Session • Sør-Norge• FA-27-10**
	Session Organizer: **Yiguang Li**, Cranfield University Session Co-Chair(s): **Qun Zheng**, Harbin Engineering University; **Michail Diakostefanis**, Cranfield University	Session Organizer: **Warren Miglietti**, Miglietti and Associates	Session Organizer: **Rainer Kurz**, Solar Turbines
8:00	GT2018:75193 **An integrated simulation tool proposed for modeling and optimization of CCHP units** ***Amir Safari, Mohsen Assadi,*** *University of Stavanger;* ***Vladimir Berezkin,*** *M.V. Lomonosov Northern Federal University*	GT2018:77482 **Brazing (Narrow Gap and Diffusion Brazing) of SuperAlloys** ***Warren Miglietti****, Miglietti and Associates*	GT2018:77342 **Oil and Gas Applications** ***Rainer Kurz****, Solar Turbines;* ***Klaus Brun****, Southwest Research Institute*
8:30	GT2018:76350 **Heavy Duty Gas Turbine Performance and Endurance Testing: The Nova LT16 experience** ***Antonio Asti, Francesco Gamberi, Nicola Giannini,*** *Baker Huges, a GE Company;* ***Giuseppe Del Vescovo, Riccardo Carta, Mirko Ignesti, Claudio Orazi, Nicola Pieroni,*** *BHGE*	DISCUSSION	TUTORIAL
9:00			
9:30			

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	ORGANIC RANKINE CYCLE POWER SYSTEMS	STEAM TURBINES	STRUCTURES & DYNAMICS: EMERGING METHODS IN DESIGN & ENGINEERING
	Cycle and Component Analysis	**Wet Steam**	**Emerging Methods Application**
	Technical Session • Hordaland • FA-28-01	**Technical Session • Romerike • FA-29-12**	**Technical Session • E-6 • FA-30-03**
	Session Organizer: **Piero Colonna,** Delft University of Technology	Session Organizer: **Mauro Melas**, General Electric Company Session Co-Chair(s): **Sebastian Schuster**, University of Cambridge and University of Duisburg	Session Organizer: **Nikola Kafedzhiyski**, Siemens Industrial Trubomachinery AB Session Co-Chair(s): **Andreas Fischersworring-Bunk,** MTU Aero Engines AG
8:00	GT2018:75442 **OFF-DESIGN PERFORMANCE COMPARATIVE ANALYSIS BETWEEN DUAL-PRESSURE ORGANIC RANKINE CYCLES USING PURE AND MIXTURE WORKING FLUIDS** ***Yang Du, Ying Long, Yaowu Huo, Pan Zhao, Jiangfeng Wang, Yiping Dai,*** *Xi'an Jiaotong University;* ***Muting Hao****, University of Oxford*	GT2018:75049 **Influence of Wet Steam on the Five-Stage Experimental Steam Turbine Efficiency** ***Michal Hoznedl,*** *Doosan Škoda Power;* ***Ladislav Tajc, Lukas Mrozek,*** *University of West Bohemia;* ***Michal Kolovratnik****, Czech Technical University in Prague;* ***Andreas Weib****, Ostbayerische Technische Hochschule Amberg-Weiden*	GT2018:75904 **The use of additive technologies to create lightweight parts for gas turbine engine compressors** ***Liubov Magerramova****, Central Institute Aviation Motors of a name's P. I. Baranova;* ***Michail Volkov, Maria Svinareva, Alex Siversky,*** *Central Institute Aviation Motors*
8:30	GT2018:75612 **DESIGN AND CFD ANALYSIS OF A 150KW 8-STAGE ORC-ROT (ORGANIC RANKINE CYCLE - RADIAL OUTFLOW TURBINE) AND PERFORMANCE DEGRADATION DUE TO BLADE TIP CLEARANCE OF LABYRINTH SEAL** ***Yahya Dogu****, Kirikkale University;* ***IBRAHIM GUNAYDIN, ZEYNAL KILICASLAN, Tacettin Ileri****, MAKIM;* ***Sinan Soganci****, Capvidia NV*	GT2018:76854 **Methodology for Evaluating Efficiency Benefits of Hydrophobic Coatings in Steam Turbine Applications** ***Mauro Melas****, General Electric Company;* ***Stefan Buehlmann, Daniela Limacher, Thomas Manyoky,*** *Institute of Thermal and Fluid Engineering;* ***Roland Sigg****, General Electric (Switzerland) GmbH*	GT2018:76306 **TWIN-WEB TURBINE DISCS: PART 1 – DESIGN AND ANALYSIS OF THEIR EFFICIENCY** ***Boris Vasilyev, Anton Salnikov, Artem Semenov, LIUBOV MAGERRAMOVA,*** *Central Institute of Avation Motors*
9:00	GT2018:76260 **Numerical Analysis of Heat Transfer Characteristics of Hexamethyldisiloxane (MM) at Supercritical Pressures** ***Jian Fu, Guoqiang Xu, Yongkai Quan, Yanchen Fu, Bensi Dong,*** *Beihang University*	GT2018:76388 **Second Law Analysis of Condensing Steam Flows** ***Marius Grubel, Markus Schatz,*** *ITSM, University of Stuttgart;* ***Damian Vogt****, University of Stuttgart*	GT2018:76310 **TWIN-WEB TURBINE DISCS: PART 2 - FABRICATION AND PROCESSING** ***Boris Vasilyev, Vladimir Isakov, Anton Salnikov, Nikolay Tsykunov,*** *CIAM; LIUBOV MAGERRAMOVA,* ***Artem Semenov,*** *Central Institute of Aviation Motors*
9:30		GT2018:77296 **LABORATORY METHOD TO EVALUATE FOG REJECTION EFFECTIVENESS OF HYDROPHOBIC COATINGS FOR STEAM TURBINE APPLICATIONS** ***Stefan Buehlmann, Daniela Limacher, Thomas Manyoky,*** *Institute of Thermal and Fluid Engineering;* ***Mauro Melas****, General Electric Company*	GT2018:76768 **Investigation of stress-strain behavior of a component under variable frequency non-proportional loading** ***Yifeng Hu, S****hanghai Electric Power Generation Equipment CO.,LTD. Shanghai Turbine Plant;* ***Gang Chen****, Shanghai Electric Power Generation Equipment Co.,Ltd;* ***Weizhe Wang****, Shanghai Jiao Tong University*

	STRUCTURES & DYNAMICS: ROTORDYNAMICS	STRUCTURES & DYNAMICS: STRUCTURAL MECHANICS, VIBRATION & DAMPING	SUPERCRITICAL CO_2 POWER CYCLES
	Rotordynamics 101 - Theory, Vibration Monitoring, and Case Studies	**Vibration and Damping of Bladed Disks**	**Supercritical CO2 Properties and Design Considerations**
	Tutorial Session • E-7 • FA-33-08	**Technical Session • E-8 • FA-35-08**	**Technical Session • Akershus • FA-38-05**
	Session Organizer: **Jerzy Sawicki**, Cleveland State University Session Co-Chair(s): **Thomas Weiss**, Rolls Royce Deutschland Ltd & Co. KG	Session Organizer: **Dr. Andreas Hartung,** MTU Aero Engines AG Session Co-Chair(s): **Alain Batailly,** Ecole Polytechnique De Montreal	Session Organizer: **Ganesan Subbaraman**, Gas Technology Institute Session Co-Chair(s): **Subith Vasu**, University of Central Florida
8:00	GT2018:77359 **Rotordynamics 101 - Theory, Vibration Monitoring, and Case Studies** ***Jason Wilkes, Aaron Rimpel**, Southwest Research Institute*	GT2018:77025 **Optimal Placement and Sizing of Piezoelectric Material for Multiple-Mode Vibration Reduction** ***Christopher Kelley, Jeffrey Kauffman,** University of Central Florida*	GT2018:75568 **EFFECT OF MIXTURES ON COMPRESSOR AND COOLER IN SUPERCRITICAL CARBON DIOXIDE CYCLES** ***Ladislav Vesely, Vaclav Dostal,** Czech Technical University In Prague; **K. R. V. Manikantachari, Jayanta Kapat, Subith Vasu,** University of Central Florida; **Scott Martin,** Embry-Riddle Aeronautical University*
8:30	T U T O R I A L	GT2018:75977 **Investigating Damping Performance of Laser Powder Bed Fused Components with Unique Internal Structures** ***Onome Scott-Emuakpor, Tommy George, Brian Runyon, Bryan Langley, Luke Sheridan,** AFRL; **Philip Johnson**, Universal Technology Corporation; **Casey Holycross,** Aerospace Systems Directorate AFRL; **Ryan O'Hara,** Air Force Institute of Technology; **Joseph Beck**, Perceptive Engineering Analytics LLC*	GT2018:75592 **Numerical Method for Simulating Supercritical CO2 Flows with High Pressure Nonequilibrium Condensation** ***Takashi Furusawa, Hironori Miyazawa, Shota Moriguchi, Satoru Yamamoto,** Tohoku Univ*
9:00		GT2018:76742 **AN EXTENSION OF THE CLASSICAL SUBSET OF NOMINAL MODES METHOD FOR THE MODEL ORDER REDUCTION OF GYROSCOPIC SYSTEMS** ***Christian U. Waldherr, Damian Vogt,** University of Stuttgart*	GT2018:75934 **Experimental and Numerical Study of Critical Flow Model Development for Supercritical CO2 Power Cycle Application** ***Min Seok Kim, Bong Seong Oh, Hwa-Young Jung, Seong Jun Bae, Jeong Ik Lee,** Korea Advanced Institute of Science and Technology (KAIST)*
9:30		GT2018:75633 **Nonlinear Vibration of Rotating Co-Rotational 2D Beams with Large Displacement** ***Fabrice Thouverez,** Laboratory of Tribology and Systems Dynamics; **Zihan Shen,** ANSYS-France; **Benjamin Chouvion**, Ecole Centrale de Lyon; **Aline Beley, Jean-Daniel Beley,** ANSYS*	GT2018:76386 **PRELIMINARY STUDY OF SUPERCRITICAL CO2 MIXED WITH GASES FOR POWER CYCLE IN WARM ENVIRONMENTS** ***Seungjoon Baik, Jeong Ik Lee,** Korea Advanced Institute of Science and Technology (KAIST)*

FRIDAY, JUNE 15 — 8:00 - 10:00 AM

	TURBOMACHINERY: AXIAL FLOW FAN & COMPRESSOR AERODYNAMICS	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: RADIAL TURBOMACHINERY AERODYNAMICS
	Manufacturing & Deterioration Effects	**Application and Methods for Unsteady Flow**	**Radial and Mixed Flow Turbines I**
	Technical Session • E-2 • FA-39-04	**Technical Session • E-3 • FA-42-21**	**Technical Session • E-4 • FA-44-01**
	Session Organizer: **Huu Duc Vo,** Ecole Polytechnique de Montreal Session Co-Chair(s): **Florian Herbst**, Leibniz Univ Hannover	Session Organizer: **Luigi Capone**, Rolls-Royce Plc Session Co-Chair(s): **Chong Cha**, Rolls-royce Corp	Session Organizer: **Bent Aamand Phillipsen,** ABB Turbo Systems Session Co-Chair(s): **A M Pradeep,** Indian Institute of Technology Bombay
8:00	GT2018:75935 **The Influence of Geometry Deformation on a Multistage Compressor** ***XIN TENG, WuLi Chu, Haoguang Zhang, kai Liu, Jinge Li,*** *Northwestern Polytechnical Univeersity*	GT2018:77204 **Unsteady Turbomachinery Simulations Using Harmonic Balance on a Discontinuous Galerkin Discretization** ***Mayank Sharma, Nathan Wukie, Matteo Ugolotti, Mark Turner,*** *University of Cincinnati*	GT2018:75096 **A numerical and experimental investigation of the impact of mixed flow turbine inlet cone angle and inlet blade angle** ***Thomas Leonard, Dietmar Filsinger, Andre Starke,*** *IHI Charging Systems International;* ***Stephen Spence****, Queens University of Belfast*
8:30	GT2018:76067 **Impact of Nonuniform Stagger Angle Distribution on High-Pressure Compressor Rotor Performance** ***Siyu Zheng, Jinfang Teng, Shaopeng Lu, Xiaoqing Qiang,*** *Shanghai Jiao Tong University;* ***Yu Wu, Fushui Guo,*** *AECC Commercial Aircraft Engine Company*	GT2018:76144 **An Adaptive Harmonic Method for Unsteady Quasi-One-Dimensional Periodic Flow** ***Yalu Zhu, Jiaqi Luo,*** *Peking University;* ***Feng Liu****, University Of California Irvine*	GT2018:76992 **Investigation into the Impact of Span-Wise Flow Distribution on the Performance of a Mixed Flow Turbine** ***Samuel Lee, Simon Barrans, Martyn Jupp,*** *University of Huddersfield;* ***Ambrose Nickson****, Borgwarner Turbo Systems*
9:00	GT2018:76340 **The Impact Of Manufacturing Variations On Performance Of A Transonic Axial Compressor Rotor** ***Marcus Lejon, Niklas Andersson,*** *Chalmers University of Technology;* ***Hans Mortensson, Lars Ellbrant,*** *GKN Aerospace*	GT2018:77264 **Scale Adaptive Simulation of Transient Behavior in a Transonic Centrifugal Compressor with a Vaned Diffuser** ***Ali Zamiri, Jin Taek Chung,*** *Korea University*	GT2018:75453 **Axial Turbine Design For a Twin-Turbine Heavy-Duty Turbocharger Concept** ***Nicholas Anton, Carl Fredriksson, Per-Inge Larsson,*** *Scania CV AB;* ***Magnus Genrup****, Lund University;* ***Anders Christiansen-Erlandsson,*** *Royal Institute of Technology*
9:30	GT2018:76644 **Full High Pressure Compressor Investigations to determine Aerodynamic Changes due to Deterioration** ***Gerald Reitz, Andreas Kellersmann,*** *TU Braunschweig, Institute of Jet Propulsion and Turbomachinery;* ***Jens Friedrichs****, TU Braunschweig*	GT2018:75524 **Mixing Losses In Steady And Unsteady Simulations Of Turbomachinery Flows** ***Daniel Schlüß, Christian Frey,*** *German Aerospace Center (DLR)*	GT2018:75522 **Performance characterization of a twin scroll volute for turbocharging applications** ***Carlo Cravero,*** *Università Degli Studi Di Genova;* ***ANDREA OTTONELLO, MARIO LA ROCCA,*** *DIME - Universita di Genovà*

TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY

Unsteady Flows in Compressors II

Technical Session • E-1 • FA-45-11

Session Organizer: **Dr. Yuan Dong**, Pratt and Whitney
Session Co-Chair(s): **Florian Danner**, MTU Aero Engines

8:00

GT2018:75569
Large Eddy Simulation of Boundary Layer Transition Mechanisms in Gas-Turbine Compressor Cascades
Ashley Scillitoe, Paul G. Tucker, *University of Cambridge;* ***Paolo Adami,*** *Rolls-Royce Deutschland*

8:30

GT2018:75631
The Influence of Rotor-Wakes on Boundary Layer Development in an Axial Compressor and its Numerical Prediction
Dominik Frieling, Achim Griebel, Florian Herbst, *Leibniz Univ Hannover;* ***Lars Wein, Joerg Seume,*** *Gottfried Wilhelm Leibniz University Hannover*

9:00

GT2018:76367
effect of wake negative jet flow on the boundary layer transition of compressor cascade
Yangang Wang, Qijie Shao, Wenbing Hu, *Northwestern Polytechnical University*

9:30

GT2018:75232
Influence of rotor-stator interatiction and reflecting boundary conditions on compressor forced response
Zhiping Mao, Shreyas Hegde, Robert Kielb, *Duke University;* ***Tianyu Pan,*** *Duke University/Beihang University;* ***Rubens Campregher,*** *ANSYS Canada Ltd;* ***Laith Zori,*** *ANSYS Inc*

FRIDAY, JUNE 15 — 10:15 AM - 12:45 PM

	AIRCRAFT ENGINE	CERAMICS	COMBUSTION, FUELS & EMISSIONS
	Nacelles, Nozzles, and Mixers	**Ceramic Matrix Composites: Components and Analysis**	**Pollutant Emissions Formation & Control II**
	Technical Session • Jan Mayen 2 • FB-1-08	**Technical Session • Oslo • FB-2-05**	**Technical Session • A1-1 • FB-4-33**
	Session Organizer: **Charlene Hu**, UTAS Aerostructures Session Co-Chair(s): **Anders Lundbladh**, GKN Aerospace	Session Organizer: **Jun Shi,** Rolls-Royce Corporation Session Co-Chair(s): **Rajesh Kumar**, United Technologies Research Ctr	Session Organizer: **Waldo Acosta,** Army Research Laboratory Session Co-Chair(s): **Ghenadie Bulat**, Siemens Industrial Turbomachinery Ltd
10:15	GT2018:75204 **Estimating the Drag Developed by a High Bypass Ratio Turbofan Engine** ***Maverick Zawislak, David Cerantola, A.M. Birk,*** *Queen's University*	GT2018:75446 **Engine Testing for the Demonstration of a 3D-Woven Based Ceramic Matrix Composite Turbine Vane Design Concept** ***Fumiaki Watanabe, Takashi Manabe,*** *IHI Corporation*	GT2018:75575 **Numerical and experimental study of the emissions during methanol combustion** ***Yeshayhaou Levy,*** *Technion;* ***Vladimir Erenburg, Alex Roizman, Valery Sherbaum,*** *Technion, Israel Institute of Technology*
10:45	GT2018:76713 **Experimental study on acoustic performances of notched nozzle using a subscale turbofan engine** ***Tatsuya Ishii, Kenichiro Nagai,*** *JAXA;* ***Hideshi Oinuma,*** *Japan Aerospace Exploration Agency;* ***Ryo Kagaya, Tsutomu Oishi,*** *IHI Corporation*	GT2018:76116 **Impact Test for the Leading Edge of CMC Vane based on Actual Aircraft Engine Field Data** ***Kenro Obuchi, Fumiaki Watanabe, Hiroyuki Yagi, Hiroshi Kuroki,*** *IHI Corporation;* ***Kazuyoshi Arai,*** *Hosei University*	GT2018:76272 **Analysis of the mixing and emission characteristics in a model combustor** ***Shan Li, Shanshan Zhang, Lingyun Hou, Zhuyin Ren,*** *Tsinghua University*
11:15	GT2018:75110 **Investigation on a blockerless thrust reverser system based on the response surface method** ***Li Zhou, Zhanxue Wang, Jingwei Shi, Xiaobo Zhang,*** *Northwestern Polytechnical University*	GT2018:76872 **Investigation of Vanadium Carbide Reinforced CMC for gas turbine stator** ***S Ram Kumar, Vikram Ramanan,*** *SRM University*	GT2018:77180 **PAHS AND SOOT EMISSIONS IN OXYGENATED ETHYLENE DIFFUSION FLAMES AT ELEVATED PRESSURES** ***Suresh Aggarwal, Krishna C. Kalvakala,*** *University of Illinois a Chicago*
11:45	GT2018:75511 **An Investigation of Flow Characteristics and Parameter Effects for a New Concept of Hybrid SVC Nozzle** ***Fu SONG, Jingwei Shi, Li Zhou, Zhanxue Wang, Xiaobo Zhang,*** *Northwestern Polytechnical University*	GT2018:75803 **Multi-lead, Direct Current Potential Drop (DCPD) as a NDE Technique for in-situ Health Monitoring of CMC Components.** ***Yogesh Singh, Michael J. Presby, Manigandan Kannan, Gregory Morscher,*** *The University of Akron*	GT2018:75564 **Alternative Aviation Fuels Evaluated for Lean-Flame NOx and Blowout, and Rich-Flame Soot Threshold** ***Arshiya Hoseyni Chime, Aman Kalia, Igor Novosselov, John Kramlich, Philip C. Malte,*** *University of Washington;* ***Shazib Vijlee,*** *University of Portland*
12:15	GT2018:77168 **Integrating Turbine Exhaust Casing Struts with Lobed Mixers for Reduced Duct Length in Intermediate-Bypass Turbofan Engines** ***Alexander Wright, Ali Mahallati, Julio Militzer,*** *Dalhousie University;* ***Martin J. Conlon,*** *Equispheres, Inc.*		

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	CONTROLS, DIAGNOSTICS & INSTRUMENTATION
	Chemical Kinetics	**Combustion Modeling II**	**Diagnostic Benchmarking and Comparative Studies**
	Technical Session • Jan Mayen 1 • FB-4-23	**Technical Session • Jan Mayen 3 • FB-4-25**	**Technical Session • Nord-Norge • FB-5-10**
	Session Organizer: **Ponnuthurai Gokulakrishnan**, Combustion Science & Engineering, Inc. Session Co-Chair(s): **Marina Braun-Unkhoff**, DLR	Session Organizer: **Alejandro M Briones**, University of Dayton Session Co-Chair(s): **Scott Martin**, Embry-Riddle Aeronautical University	Session Organizer: **Chad Holcomb**, Solar Turbines Inc. Session Co-Chair(s): **Donald L. Simon**, NASA Glenn Research Center
10:15	GT2018:75064 **Experimental Determination of Lean Flammability Limits of Renewable Gas Mixtures and Process Gas Mixtures at Elevated Temperature and Pressure Conditions** ***Daniel Jaimes**, Advanced Power and Energy Program - UC Irvine Combustion Laboratory; **Vincent McDonell, Scott Samuelsen**, University Of California*	GT2018:76125 **Large Eddy Simulation of a two-phase staged swirling burner using an Euler-Lagrange Approach: validation of the injection strategy** ***Leo Cunha Caldeira Mesquita, Aymeric Vie, Sebastien Ducruix**, Laboratoire EM2C, CNRS, Centralesupelec, Universite Paris-Saclay*	GT2018:76414 **FLEET MONITORING AND DIAGNOSTICS FRAMEWORK BASED ON DIGITAL TWIN OF AERO-ENGINES** ***Valentina Zaccaria, Ioanna Aslanidou, Konstantinos Kyprianidis**, Malardalen University; **Mikael Stenfelt**, SAAB*
10:45	GT2018:75407 **HIGH PRESSURE IGNITION DELAY TIMES MEASUREMENTS AND COMPARISON OF THE PERFORMANCE OF SEVERAL OXY-SYNGAS MECHANISMS UNDER HIGH CO_2 DILUTION** ***Samuel Barak, Erik Ninnemann, Sneha Neupane, Frank Barnes, Jayanta Kapat, Subith Vasu**, University of Central Florida*	GT2018:75131 **High Resolution Large Eddy Simulations To Evaluate Turbulence Properties Within A Real Helicopter Engine Combustor** ***Charlie Koupper, Jean Lamouroux, Stephane Richard**, Safran Helicopter Engines; **Gabriel Staffelbach**, CERFACS*	GT2018:76630 **A Comparative Study of Data and Physically Based Gas Turbine Modeling for Long-Term Monitoring Scenarios Part I: Thermodynamic Performance Prediction Without Design Information** ***Thomas Bexten, Moritz Lipperheide, Manfred Wirsum**, Rwth-Aachen University; **Liu Pei, Li Zheng**, Tsinghua University*
11:15	GT2018:75874 **NOx-Hydrocarbon Kinetics Model Validation Using Measurements of CO and H_2O in Shock-Heated CH_4/C_2H_6 Mixtures with O_2 or NO_2 as Oxidant** ***Olivier Mathieu, Clayton R. Mulvihill, Eric L. Petersen**, Texas A&m University; **Henry Curran**, NUI Galway*	GT2018:75638 **Assessment of a Finite-Rate-Chemistry Model for ANSYS CFX Using Experimental Data of a Downsized Gas Turbine Combustor** ***Andreas Fiolitakis, Rainer Lueckerath, Oliver Lammel, Guido Schmitz, Holger Ax, Michael Stoehr, Christoph Arndt, Berthold Noll**, German Aerospace Center (DLR); **David Kluss**, MAN Diesel and Turbo SE*	GT2018:76650 **A Comparative Study of Data and Physically Based Gas Turbine Modeling for Long-Term Monitoring Scenarios Part II: Emission Prediction Utilizing Different Levels of Design Information** ***Moritz Lipperheide, Thomas Bexten, Manfred Wirsum**, RWTH Aachen University; **Martin Gassner, Stefano Bernero**, GE Power*
11:45	GT2018:75579 **Uncertainty Quantification of NOx Emissions Induced through the Prompt Route in Premixed Alkane Flames** ***Antoine Durocher, Philippe Versailles, Jeffrey Bergthorson**, McGill University; **Gilles Bourque**, Siemens Canada*	GT2018:75601 **Large Eddy Simulation to Predict Flame Front Position for Turbulent Lean Premixed Jet Flame at High Pressure** ***Keita Yunoki, Tomoya Murota**, Mitsubishi Hitachi Power Systems, Ltd.*	GT2018:76647 **EVALUATION OF AIRCRAFT ENGINE GAS PATH DIAGNOSTIC METHODS THROUGH ProDiMES** ***Orestis A. Koskoletos, Nikolaos Aretakis, Alexios Alexiou, Christoforos Romesis, Konstantinos Mathioudakis**, National Tech University of Athens*
12:15	GT2018:76855 **REDUCED KINETIC MODELS AND SENSITIVITY TO KINETIC MODELS IN THE SIMULATION OF SCO_2 OXY-COMBUSTION** ***Wenting Sun, Zefang Liu, Xiang Gao, Vishal Acharya, Miad Karimi, Bradley Ochs**, Georgia Institute of Technology; **Jacob Delimont, Nathan Andrews**, Southwest Research Institute*		GT2018:76887 **A Benchmarking Analysis of a Data-Driven Gas Turbine Diagnostic Approach** ***Igor Loboda, Juan Luis Perez Ruiz**, Instituto Politecnico Nacional; **Sergiy Yepifanov**, National Aerospace University "Kharkiv Aviation Institute"*

	HEAT TRANSFER: EXPERIMENTAL FILM COOLING	HEAT TRANSFER: EXPERIMENTAL INTERNAL COOLING	HEAT TRANSFER: GENERAL EXPERIMENTAL HEAT TRANSFER
	Film Cooling - Internal Geometry Effects	**Cooling with Rotation**	**Experimental Heat Transfer Methods and Heat Exchangers**
	Technical Session • A1-6 • FB-19-05	**Technical Session • A1-2 • FB-16-05**	**Technical Session • A1-3 • FB-13-04**
	Session Organizer: **Beni Cukurel,** Technion - Israel Institute of Technology Session Co-Chair(s): **Eric Ruggiero,** GE Aviation	Session Organizer: **Lesley Wright,** Baylor University Session Co-Chair(s): **Yao Hsien Liu,** National Chiao-Tung University	Session Organizer: **Jae Um,** Siemens Energy Inc. Session Co-Chair(s): **Robert Krewinkel,** MAN Diesel & Turbo SE
10:15	GT2018:75794 **Investigations on the Influence of Rib Orientation Angle on Film Cooling Performance of Compound Holes** ***Lin Ye, Cunliang Liu, Haiyong Liu, Huiren Zhu,*** *Northwestern Polytechnical University;* ***Jianxia Luo,*** *AECC Commerical Aircraft Engine Co., LTD*	GT2018:76372 **Influences of the Non-uniform Pin-Fin Array on Heat Transfer Distribution in a Rotating Rectangular Channel** ***Shuo-Cheng Hung, Szu-Chi Huang, Yao Hsien Liu,*** *National Chiao-Tung University*	GT2018:76361 **Measurement Uncertainty In Steady-State Liquid Crystal Thermography Applied To Internal Cooling Research: Two Practical Examples** ***Ignacio Mayo,*** *Rolls-Royce PLC;* ***Marco Virgilio, Bogdan Cezar Cernat, Tony Arts,*** *Von Karman Inst*
10:45	GT2018:75857 **Rib Turbulator Effects on Crossflow-Fed Shaped Film Cooling Holes** ***Dale Fox,*** *Univ. of Texas;* ***Fraser Jones, David Bogard,*** *University of Texas At Austin;* ***John McClintic,*** *Honeywell Aerospace;* ***Thomas Dyson,*** *GE Global Research;* ***Zachary Webster,*** *GE Aviation*	GT2018:76449 **Heat Transfer in a Two-inlet Rotating Pin-fin Roughened Rectangular Channel with Side-wall Fluid Extraction** ***Yanan Chen,*** *Beijing University of Aeronautics and Astronautics;* ***Jie Wen, Guoqiang Xu,*** *Beihang University; Zhiliang Du,* ***Yunqing Dai,*** *School of Energy and Power Engineering, Beihang University*	GT2018:76874 **Three dimensional velocity and temperature field measurements of internal and external turbine blade features using Magnetic Resonance Thermometry** ***Michael Benson, Bret Van Poppel,*** *U.S. Military Academy;* ***Mark Owkes,*** *Montana State University;* ***Christopher J. Elkins,*** *Stanford University*
11:15	GT2018:76268 **Investigation on Film Cooling Performance of the Compound Hole and Y-Shaped Hole Configurations with the Cross-flow Coolant Channel** ***Lin Li, Cunliang Liu, Haiyong Liu, Huiren Zhu,*** *Northwestern Polytechnical University;* ***Jianxia Luo,*** *AECC Commerical Aircraft Engine Co., LTD*	GT2018:76684 **MULTI-PASS SERPENTINE COOLING DESIGNS FOR NEGATING CORIOLIS FORCE EFFECT ON HEAT TRANSFER: SMOOTH CHANNELS** ***Prashant Singh,*** *Virginia Tech;* ***Yongbin Ji,*** *Shanghai Jiao Tong University;* ***Srinath Ekkad,*** *North Carolina State University*	GT2018:75924 **Development of a Steady-State Experimental Facility for the Aerothermal Analysis of Double-Wall Effusion Cooling Geometries** ***Alexander V. Murray, Peter Ireland,*** *University of Oxford;* ***Eduardo Romero,*** *Rolls Royce*
11:45	GT2018:76904 **Investigation of Flow Physics for Film Cooling Holes Fed by Internal Crossflow** ***John McClintic,*** *Honeywell Aerospace;* ***Dale Fox,*** *Univ. of Texas;* ***Fraser Jones, David Bogard,*** *University of Texas At Austin;* ***Thomas Dyson,*** *GE Global Research;* ***Zachary Webster,*** *GE Aviation*	GT2018:76689 **MULTI-PASS SERPENTINE COOLING DESIGNS FOR NEGATING CORIOLIS FORCE EFFECT ON HEAT TRANSFER: 45-DEGREE ANGLED RIB TURBULATED CHANNELS** ***Prashant Singh,*** *Virginia Tech;* ***Yongbin Ji,*** *Shanghai Jiao Tong University;* ***Srinath Ekkad,*** *North Carolina State University*	GT2018:76890 **GAS TEMPERATURE MEASUREMENT IN ENGINE CONDITIONS USING UNIFORM CRYSTAL TEMPERATURE SENSORS (UCTS)** ***Anastasia Thomas, Edward Ginzbursky,*** *LG Tech-Link Global, LLC;* ***Jason DeVoe,*** *QuEST Global Services;* ***Reagan DeVoe,*** *University of Arizona, Department of Aerospace and Mechanical Engineering*
12:15	GT2018:77061 **DOUBLE WALL COOLING OF A FULL COVERAGE EFFUSION PLATE WITH CROSS FLOW SUPPLY COOLING AND MAIN FLOW PRESSURE GRADIENT** ***Christopher Allgaier,*** *University of Stuttgart;* ***Zhong Ren, Sneha Reddy Vanga, Phil Ligrani,*** *Univ of Alabama In Huntsville;* ***Federico Liberatore, Rajeshriben Patel, Ram Srinivasan, Yin-hsiang Ho,*** *Solar Turbines Inc.*	GT2018:76411 **Aerothermal Investigation of a Two-Pass Rotating Cooling Channel by Means of Particle Image Velocimetry and Liquid Crystal Thermography** ***Dimitra Tsakmakidou, Tony Arts,*** *Von Karman Inst;* ***Ignacio Mayo,*** *Rolls-Royce PLC*	GT2018:76168 **Heat transfer coefficient characterization for large aspect-ratio thin films in film-riding seals** ***James A. Tallman, Rahul A. Bidkar,*** *General Electric*

FRIDAY, JUNE 15 — 10:15 AM - 12:45 PM

	HEAT TRANSFER: NUMERICAL INTERNAL COOLING	MANUFACTURING MATERIALS & METALLURGY	OIL & GAS APPLICATIONS
	Rotating Flows	**Component Repairs**	**Risk Assessment at LNG Plant**
	Technical Session • A1-4 + A1-5 • FB-11-03	**Technical Session • Svalbard • FB-24-08**	**Tutorial Session • Sør-Norge• FB-27-09**
	Session Organizer: **Gongnan Xie**, Northwestern Polytechnical University Session Co-Chair(s): **Bengt Sunden**, Lund University	Session Organizer: **Yu Haojun**, Institute of Metal Research,China Session Co-Chair(s): **David Day**, PSM - Ansaldo Energia Group	Session Organizer: **George Orme**, Berkshire Hathaway Specialty Insurance
10:15	GT2018:75278 **Influence of Rotating Directions on Hydro-Thermal Characteristics of a Two-Pass Parallelogram Channel with Detached Transverse Ribs** ***Tong Miin Liou, Chihyung Huang, I-An Lan, Shu-Po Chan,*** *National Tsing Hua Univ;* ***Shyy Woei Chang,*** *National Cheng Kung University*	GT2018:75432 **Effects on Heat Treatments on Microstructure-Mechanical Properties in GTD-111 alloy in Heavy Frame Gas Turbines** ***John Scheibel,*** *Electric Power Research Institute;* ***Rajeev Aluru,*** *Duke Energy;* ***Hans Van Esch,*** *TEServices*	GT2018:77516 **Risk Assessment at Combined Cycle Power Plants** ***George Orme,*** *Berkshire Hathaway Specialty Insurance*
10:45	GT2018:76158 **Effect of Dimple Depth on Flow Structure and Heat Transfer in a Rotating Channel with Dimple-Pin Fin** ***Wei Du, Lei Luo, Songtao Wang,*** *Harbin Institute of Technology*	GT2018:75696 **DEVELOPMENT OF BLADE TIP REPAIR FOR SGT-700 TURBINE BLADE STAGE 1, WITH OXIDATION RESISTANT WELD ALLOY** ***Dikran Barhanko, Niclas Aberg,*** *Siemens Industrial Turbomachinery AB;* ***Olov H. Andersson,*** *Siemens Industrial Turbo Machinery*	**T U T O R I A L**
11:15	GT2018:76497 **Numerical Investigation of Transient Heat Transfer Experiments Under Rotation** ***Michael Göhring, Christopher Hartmann, Jens von Wolfersdorf,*** *University of Stuttgart, Institute of Aerospace Thermodynamics (ITLR)*	GT2018:76364 **Technology-based Re-contouring of Blade Integrated Disks After Weld Repair** ***Berend Denkena, Arne Mucke, Tim Schumacher, Demian Langen, Thomas Hassel,*** *Leibniz Universitat Hannover*	
11:45	GT2018:76643 **NON-LINEAR K-eps-zita-f MODEL SENSITIZED TO ROTATION FOR BLADE TURBINE INTERNAL COOLING** ***Domenico Borello, Alessandro Salvagni,*** *Sapienza University of Rome*	GT2018:75395 **Linking MRO to Prognosis based Health Management through Physics-of Failures Understanding** ***Prakash Patnaik,*** *Aerospace, National Research Council Canada;* ***Xijia Wu,*** *National Research Council Canada*	
12:15	GT2018:76678 **Numerical Study on Local Heat Transfer in a Rotating Cooling Channel** ***Min Ren, XUEYING LI, Jing Ren, Hongde Jiang,*** *Tsinghua University*		

FRIDAY, JUNE 15 — 10:15 AM - 12:45 PM

	ORGANIC RANKINE CYCLE POWER SYSTEMS	STEAM TURBINES	STRUCTURES & DYNAMICS: AERODYNAMIC EXCITATION & DAMPING
	Design and Testing	**Mechanical Aspects**	**Introduction to Turbomachinery Aeromechanics (No Equations)**
	Technical Session • Hordaland • FB-28-02	**Technical Session • Romerike • FB-29-08**	**Tutorial Session • Event Room • FB-36-06**
	Session Organizer: **Teemu Turunen-Saaresti**, Lappeenranta University of Technology	Session Organizer: **Christian Kontermann**, Technische Universitaet Darmstadt Session Co-Chair(s): **Deqi Yu**, Shanghai Electric; **Klaus Helbig**, GE Germany	Session Organizer: **Harald Schoenenborn**, MTU Aero Engines AG
10:15	GT2018:75126 **Development and demonstration of 20kW/30kW Organic Rankine Cycle system powered by waste heat for Heuksan island 1MW-diesel power plant** ***Sanghyup Lee, HOON JUNG,*** *KEPCO/KEPRI*	GT2018:75829 **Utilization of a thermo-mechanical model coupled with multi-objective optimization to enhance the start-up process of solar steam turbines** ***Monika Topel, Andrea Vitrano,*** *KTH Royal Institute of Technology;* ***Bjorn Laumert****, Royal Institute of Technology*	GT2018:77446 **Introduction to Turbomachinery Aeromechanics (No Equations)** ***Matthew Montgomery****, Doosan ATS America*
10:45	GT2018:75301 **Design Of A Closed-Loop Optical-Access Supersonic Test Facility For Organic Vapours** ***Martin T. White****, Abdulnaser Sayma, City, University of London*	GT2018:75681 **On the evaluation and consideration of fracture mechanical notch support within a creep-fatigue lifetime assessment** ***Christian Kontermann, Matthias Oechsner,*** *Technische Universitaet Darmstadt;* ***Henning Almstedt****, Siemens AG;* ***Falk Mueller****, IfW MPA Darmstadt; Technische Universitaet Darmstadt*	
11:15	GT2018:77129 **The Development And Testing Of A Dual-Entry Turbine Expander For ORC Applications** ***Jeff Noall****, Barber Nichols Inc;* ***Timothy Ernst****, Cummins Inc.*	GT2018:75174 **Improvement in the Rapid Startup Performance for the Solar Steam Turbine** ***Peng Wang, Gang Chen,*** *Shanghai Electric Power Generation Equipment Co.,Ltd;* ***Wenfu*** *Li, Shanghai Turbine Works co . ltd*	
11:45		GT2018:75897 **Metallographic and Materials Evaluation of a Cracked Radial Steam Turbine Rotor** ***Vamadevan Gowreesan,*** *Sulzer RES;* ***Wayne Greaves****, Sulzer Turbo Services*	
12:15		GT2018:76277 **Numerical Study on Deformation of Gland Seal Housing at LP ends on a Nuclear Steam Turbine** ***Yanan Guo, Danmei Xie,*** *Hydraulic Machinery Transients Key Laboratory of Ministry of Education (Wuhan University);* ***Xiangjun Huang, Huabing Zheng,*** *China Nuclear Power Operations Co.,Ltd; Ziyue Mei, Hydraulic Machinery Transients Key Laboratory of Ministry of Education (Wuhan University);* ***Hengliang Zhang****, Wuhan University*	

TUTORIAL

	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS	STRUCTURES & DYNAMICS: EMERGING METHODS IN DESIGN & ENGINEERING	STRUCTURES & DYNAMICS: PROBABILISTIC METHODS
	Seals 4	**Developments in Optimization Methods and Parameter Studies**	**Probabilistic Application - Blades**
	Technical Session • E-8 • FB-34-15	**Technical Session • E-6 • FB-30-01**	**Technical Session • E-5 • FB-32-03**
	Session Organizer: **Jianming Cao**, Rotor Bearing Solution International Session Co-Chair(s): **Tim Dimond**, Rotor Bearing Solutions International	Session Organizer: **Partha S Das**, Honeywell International, Inc. Session Co-Chair(s): **Andreas Fischersworring-Bunk,** MTU Aero Engines AG; **Bernd Beirow**, Brandenburg University Of Technology Cottbus-Senftenberg	Session Organizer: **Michael Enright**, Southwest Research Inst Session Co-Chair(s): **Florian Danner**, MTU Aero Engines AG
10:15	GT2018:76864 **Impact Analysis of Pocket Damper Seal Geometry Variations on Leakage Performance and Rotordynamic Force Coefficients Using CFD** ***Clemens Griebel**, Technical University of Munich*	GT2018:75781 **REDUCTION OF THE DESIGN SPACE TO OPTIMIZE BLADE FIR-TREE ATTACHMENTS** ***Farhad Alinejad**, **Muzio M. Gola**, **Daniele Botto**, Politecnico di Torino; **Andrea Bessone**, Ansaldo Energia*	GT2018:75755 **Approximate solution of the Fokker-Planck equation for a multi-degree of freedom frictionally damped bladed disk under random excitation** ***Alwin Foerster**, University Hannover; **Lars Panning-von Scheidt**, **Joerg Wallaschek**, Leibniz Universitat Hannover*
10:45	GT2018:77198 **PREDICTIONS FOR NON-CONTACTING MECHANICAL FACE SEAL VIBRATION WITH EXCITATION FROM PUMP VIBRATION - PART I: FLEXIBLIY MOUNTED STATOR** ***Clay S Norrbin**, **Dara Childs**, Texas A & M Univ*	GT2018:75685 **Using Robust Design Methods For the Fir Tree Optimization Problem** ***Boris Vasilyev**, **Anton Salnikov**, CIAM; **Artem Semenov**, Central Institute of Aviation Motors*	GT2018:76800 **ACTIVE SUBSPACE DEVELOPMENT OF INTEGRALLY BLADED DISK DYNAMIC PROPERTIES DUE TO MANUFACTURING VARIATIONS** ***Joseph Beck**, Perceptive Engineering Analytics LLC; **Jeffrey M. Brown**, **Emily Carper**, Air Force Research Laboratory; **Alex Kaszynski**, Universal Technology Corporation*
11:15	GT2018:77200 **PREDICTIONS FOR NON-CONTACTING MECHANICAL FACE SEAL VIBRATION WITH EXCITATION FROM PUMP VIBRATION - PART II: FLEXIBLIY MOUNTED ROTOR** ***Clay S Norrbin**, **Dara Childs**, Texas A & M Univ*	GT2018:77188 **Rapid Visualization Of Compressor Blade Finite Element Models Using Surrogate Modeling** ***Spencer Bunnell**, **Steven Gorrell**, **Christopher Thelin**, **John Salmon**, Brigham Young University; **Christopher Ruoti**, **Ammon Hepworth**, Pratt and Whitney*	GT2018:75854 **APPLICATION OF SURROGATE MODELS AND PROBABILISTIC DESIGN METHODOLOGY TO ASSESS CREEP GROWTH LIMIT OF AN UNCOOLED TURBINE BLADE** ***Armin Hadadian**, **Sairam Prabhakar**, **Keith Taylor** Siemens Canada Limited; **Bjorn Sjodin**, Siemens Industrial Turbomachinery AB*
11:45	GT2018:75645 **Nonlinear Analysis of Rotor-dynamic Fluid Forces in the Annular Plain Seal by Using Extended Perturbation Analysis of the Bulk-Flow Theory (Influence of Static Eccentricity and Whirling Amplitude)** ***KOYA Yamada**, **Atsushi Ikemoto**, **Tsuyoshi Inoue**, Nagoya University; **MASAHARU** UCHIUMI, Muroran institute of Technology*	GT2018:76482 **Towards structural topology optimization of rotor blisks** ***Enrico Meli**, **Enrico Boccini**, **Andrea Rindi**, **Andrea Arnone**, **Lorenzo Pinelli**, **Lorenzo Peruzzi**, University of Florence*	GT2018:75927 **Probabilistic TMF life evaluation of a single crystal turbine blade concerning uncertainty quantification** ***Xi Liu**, **Dianyin Hu**, **Bin Zhang**, **Rongqiao Wang**, Beihang University*
12:15	GT2018:76634 **A CFD Based Approach For Estimation Of Rotor Dynamic Coefficients For Liquid Annular Seals In Turbomachinery** ***Bachanti Datta Krishna**, **B Premchandran**, **Ashish Darpe**, Indian Institute of Technology Delhi*	GT2018:76552 **Towards the Structural Optimization of Bladed Components Featuring Contact Interfaces** ***Julien Laine**, Polytechnique Montreal; Elsa Piollet, **Alain Batailly**, Ecole Polytechnique De Montreal*	

FRIDAY, JUNE 15 — 10:15 AM - 12:45 PM

	SUPERCRITICAL CO_2 POWER CYCLES	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY	TURBOMACHINERY: DESIGN METHODS & CFD MODELING FOR TURBOMACHINERY
	Supercritical CO2 Testing	**Turbine Design Methods and Applications**	**Novel Solver and Simulation Frameworks**
	Technical Session • Akershus • FB-38-04	**Technical Session • E-4 • FB-42-06**	**Technical Session • E-3 • FB-42-16**
	Session Organizer: **Robin Ames**, DoE National Energy Technology Lab	Session Organizer: **John Clark**, AFRL/RQTT Session Co-Chair(s): **Thomas Praisner**, Pratt And Whitney; **Vikram Shyam**, NASA	Session Organizer: **RAUL VAZQUEZ DIAZ**, ROLLS-ROYCE Plc Session Co-Chair(s): **Roque Corral**, Industria de Turbopropulsores S.A.
10:15	GT2018:75182 **Effect of Compressor Inlet Conditions on Cycle Performance for a Supercritical Carbon Dioxide Brayton Cycle** ***Eric Clementoni**, Bechtel Marine Propulsion Corporation; **Tim Cox**, Naval Nuclear Laboratory*	GT2018:76749 **On the Simulation of Unsteady Turbulence and Transition Effects in a Multistage Low Pressure Turbine, Part III: Comparison of Harmonic Balance and Full Wheel Simulation** ***Edmund Kugeler, Georg Geiser, Jens Wellner, Anton Weber**, German Aerospace Center (DLR); **Anselm Moors**, MTU Aero Engines AG*	GT2018:75447 **Development and Use of Machine-Learnt Algebraic Reynolds Stress Models for Enhanced Prediction of Wake Mixing in LPTs** ***Harshal D Akolekar, Jack Weatheritt, Nicholas Hutchins, Richard Sandberg**, The University of Melbourne; **Gregory Laskowski**, GE Aviation; **Vittorio Michelassi**, Baker Hughes a GE company*
10:45	GT2018:75873 **Planning for Successful Transients and Trips in a MW-scale High-Temperature sCO2 Test Loop** ***Timothy Allison, J. Jeffrey Moore, Meera Day Towler**, Southwest Research Institute; **Douglas Hofer**, GE Global Research; **Joseph Thorp**, Aramco Services*	GT2018:76756 **On the Simulation of Unsteady Turbulence and Transition Effects in a Multistage Low Pressure Turbine, Part I: Verification and Validation** ***Graham Ashcroft, Christian Frey, Hans-Peter Kersken, Edmund Kugeler**, German Aerospace Center (DLR); **Nina Wolfrum**, MTU Aero Engines*	GT2018:75495 **On The Development Of Harmonic Balance Methods For Multiple Fundamental Frequencies** ***Laura Junge**, Graham Ashcroft, Hans-Peter Kersken, **Christian Frey**, German Aerospace Center (DLR)*
11:15	GT2018:76488 **DEVELOPMENT AND OPERATION OF SUPERCRITICAL CARBON DIOXIDE POWER CYCLE TEST LOOP WITH AXIAL TURBO-GENERATOR** ***Junhyun Cho, Hyungki Shin, Jongjae Cho**, Ho-Sang Ra, Gilbong Lee, Chulwoo Roh, Beomjoon Lee, Bongsu Choi, Young-Jin Baik, Korea Institute of Energy Research*	GT2018:76764 **On the Simulation of Unsteady Turbulence and Transition Effects in a Multistage Low Pressure Turbine, Part II: Full-Wheel Simulation** ***Georg Geiser, Jens Wellner, Edmund Kugeler, Anton Weber**, German Aerospace Center (DLR); **Anselm Moors**, MTU Aero Engines AG*	GT2018:76004 **On the use of the automatic differentiation for developing a linear harmonic solver** ***Wei Zhang, Dingxi Wang, Xiuquan Huang, Hong Yan**, Jianling Li, Northwestern Polytechnical University;* ***Tianxiao Yang**, Aero Engine Academy of China*
11:45	GT2018:77044 **TESTING OF A NEW TURBOCOMPRESSOR FOR SUPERCRITICAL CARBON DIOXIDE CLOSED BRAYTON CYCLES** ***Jim Pasch**, Sandia National Lab; **David Stapp**, Peregrine Turbine Technologies*	GT2018:75626 **Comparison Of Linear And Nonlinear Frequency Domain Methods For Flutter Analysis** ***Hans-Peter Kersken, Graham Ashcroft, Christian Frey**, German Aerospace Center (DLR); **Nina Wolfrum**, MTU Aero Engines; **Oliver Putz**, Siemens*	GT2018:76703 **Forced Response Sensitivity Analysis Using an Adjoint Harmonic Balance Solver** ***Anna Engels-Putzka, Jan Backhaus, Christian Frey**, German Aerospace Center (DLR)*
12:15	GT2018:76508 **Design, Flow Simulation and Performance Test for Partial Admission Axial Turbine on Supercritical CO2 Condition** ***Jongjae Cho, Hyungki Shin, Junhyun Cho, Young-Jin Baik, Bongsu Choi, Chulwoo Roh, Ho-Sang Ra**, Korea Institute of Energy Research; **Young Seok Kang, Jaesung Huh**, Korea Aerospace Research Institute*		GT2018:77066 **Efficient Adjoint-Based Mesh Adaptation Applied to Turbo-Machinery Flows** *Guglielmo Vivarelli, Ning Qin, University of Sheffield; Shahrokh Shahpar, David Radford, Rolls-Royce*

FRIDAY, JUNE 15 — 10:15 AM - 12:45 PM

	TURBOMACHINERY: MULTIDISCIPLINARY DESIGN APPROACHES, OPTIMIZATION & UNCERTAINTY QUANTIFICATION	TURBOMACHINERY: UNSTEADY FLOWS IN TURBOMACHINERY	AIRCRAFT ENGINE
	Turbine Design and Cooling	**Stall and Surge II**	**Modeling, Simulation and Validation**
	Technical Session • E-2 • FB-46-05	**Technical Session • E-1 • FB-45-07**	**Technical Session • Jan Mayen 2 • FC-1-02**
	Session Organizer: **Shahrokh Shahpar**, Rolls-Royce plc., ML-83 Session Co-Chair(s): **Pranay Seshadri**, Cambridge University	Session Organizer: **Reid A. Berdanier,** Penn State University Session Co-Chair(s): **Anthony Gannon**, Naval Postgraduate School	Session Organizer: **Stefan Bretschneider**, MTU Aero Engines North America Session Co-Chair(s): **Wilfried Visser**, Delft University
10:15	GT2018:75683 **Single-point optimization of the LS89 turbine cascade using an hybrid algorithm** ***Arnaud Châtel, Tom Verstraete,*** *Von Karman Institute for Fluid Dynamics;* ***Gregory COUSSEMENT****, University of Mons - Fluids/ Machines Dep;* ***Lasse Mueller****, Von Karman Institute*	GT2018:75283 **Post-stall behaviour of a multi-stage high speed compressor at off-design conditions** ***Fanzhou Zhao, Mehdi Vahdati,*** *Imperial College London;* ***John Dodds****, Rolls-Royce plc*	GT2018:75719 **Integration of 3D-CFD component simulation in overall engine performance analysis for engine condition monitoring purposes** ***Carsten Klein, Florian Wolters, Stanislaus Reitenbach, Dirk schoenweitz,*** *German Aerospace Center, DLR*
10:45	GT2018:76534 **A 3D Conjugate Approach for Analysing a Double-Walled Effusion-Cooled Turbine Blade** ***Gladys C. Ngetich, Peter Ireland, Alexander V. Murray,*** *University of Oxford; Eduardo Romero, Rolls Royce*	GT2018:75052 **Shock Tube Simulation Of The Transient Surge Phase Inside An Axial Compressor** ***Paul Xiubao Huang,*** *Hi-Bar Inc;* ***Robert S. Mazzawy,*** *Trebor Systems, LLC*	GT2018:76153 **Application of Kriging Metamodels to the Automated Start Value Generation for Gas Turbine Performance Simulations** ***Jens Schmeink, Richard-Gregor Becker,*** *German Aerospace Center (DLR)*
11:15	GT2018:76594 **Aero-Thermal Coupled Design Optimization of the Non-Axisymmetry Endwall for a Turbine Blade** ***Zhansheng Liu, Xing Yang, Chun Gao, Zhao Liu, Zhenping Feng,*** *Xi'An Jiaotong University*	GT2018:76301 **Stall warning using the rotor tip pressure in a transonic axial compressor with circumferential grooves** ***Byeung Jun Lim, Tae Choon Park, Young Seok Kang,*** *Korea Aerospace Research Institute*	
11:45	GT2018:77252 **A conjugate heat transfer analysis procedure in turbine aerodynamic design considering heat transfer performance** ***Liu Wei, Wen Fengbo, Lei Luo, Tao Cui, Songtao Wang,*** *Harbin Institute of Technology*	GT2018:76701 **Effects of Rotating Inlet Distortion on Two-Stage Compressor Stability with Stall Precursor-Suppressed Casing Treatment** ***Dakun Sun, Jia Li, Xu Dong, Benhao Gu,*** *Beihang University;* ***Xiaofeng Sun****, Beijing University of Aeronautics and Astronautics*	
12:15		GT2018:76821 **Numerical investigation of rotating instability in a low-speed axial compressor** ***Hao Wang,*** *Northwestern Polytechnical University;* ***Yadong Wu, HUA OUYANG,*** *Shanghai Jiao Tong University*	

FRIDAY, JUNE 15 — 2:00 - 3:30 PM

	COMBUSTION, FUELS & EMISSIONS	COMBUSTION, FUELS & EMISSIONS	HEAT TRANSFER: COMBUSTORS (WITH COMBUSTION, FUELS & EMISSIONS)
	Flashback & Blowout II	**Flashback & Blowout I**	**Combustor Heat Transfer**
	Technical Session • A1-1 • FC-4-32	**Technical Session • Jan Mayen 3 • FC-4-28**	**Technical Session • A1-6 • FC-17-03**
	Session Organizer: **Shivakumar Srinivasan**, GE Energy Session Co-Chair(s): **William D. York,** GE Power	Session Organizer: **Sunil James**, Honeywell	Session Organizer: **Nagaraja Rudrapatna**, Honeywell Session Co-Chair(s): **Jens von Wolfersdorf,** University of Stuttgart, Institute of Aerospace Thermodynamics (ITLR)
2:00	GT2018:75546 **Prediction of Boundary Layer Flashback Limits of Laminar Premixed Jet Flames** ***Vera Hoferichter, Thomas Sattelmayer, Christoph Hirsch,*** *Technical Univ Munich*	GT2018:75245 **Evaluation of impact on Lean Blowout Limit and ignition delay while using alternative fuels on gas turbine combustor** ***Ihab Ahmed, Lukai Zheng, Emamode Ubogu, Bhupendra Khandelwal,*** *University of Sheffield*	GT2018:75591 **Coupling Process Analysis On The Flow And Heat Transfer Of Hydrocarbon Fuel With Pyrolysis And Pyrolytic Coking Under Supercritical Pressures** ***Chaofan Zhao, Xizhuo Hu, Jianqin Zhu, Zhi Tao,*** *Beihang University*
2:30	GT2018:76229 **Numerical Investigation of a Lean Premixed Swirl-Stabilized Hydrogen Combustor and Operational Conditions Close to Flashback** ***Daniel Mira, Oriol Lehmkuhl, Mariano Vazquez, Guillaume Houzeaux,*** *BSC* ***Panagiotis Stathopoulos, Tom Tanneberger, Thoralf Reichel,*** *Technical University of Berlin;* ***Christian Oliver Paschereit****, H.F.I TU Berlin*	GT2018:75647 **Liftoff and reattachment dynamics of a linear multi-nozzle combustor** ***Wing Yin Penelope Kwong, Adam Steinberg,*** *University of Toronto, Institute of Aerospace Studies*	GT2018:76578 **MULTI-PHYSICS SIMULATIONS WITH OPENFOAM IN THE RE-DESIGN OF A COMMERCIAL COMBUSTOR** ***Marco Konle, Ludovic de Guillebon,*** *MTU Aero Engines AG;* ***Christopher Beebe,*** *Vericor Power Systems*
3:00	GT2018:75834 **Towards Improved Boundary Layer Flashback Resistance of a 65kw Gas Turbine With a Retrofittable Injector Concept** ***Alireza Kalantari,*** *UCI Combustion Laboratory;* ***Vincent McDonell, Scott Samuelsen****, Univ Of California;* ***Shahram Farhangi,*** *Capstone Turbine Corp****; Don Ayers****, Capstone Turbine Corporation*	GT2018:77070 **On Predictions of Fuel Effects on Lean Blow Off Limits in a Realistic Gas Turbine Combustor using Finite Rate Chemistry** ***Joshua Piehl, Omid Samimi Abianeh,*** *Wayne State University;* ***Luis G. Bravo, Waldo Acosta,*** *U.S. Army Research Laboratory;* ***Gaurav Kumar, Scott Drennan,*** *Convergent Science, Inc.*	GT2018:76579 **Assessment of external heat transfer modeling of a laboratory-scale combustor inside a pressure-housing environment** ***Pedro Rodrigues, Olivier Gicquel, Ronan Vicquelin,*** *Laboratoire EM2C, CentraleSupelec, CNRS* ***Nasser Darabiha****, EM2C-CNRS/CentraleSupelec;* ***Klaus Peter Geigle,*** *German Aerospace Center (DLR)*

FRIDAY, JUNE 15 — 2:00 - 3:30 PM

	HEAT TRANSFER: EXPERIMENTAL INTERNAL COOLING	HEAT TRANSFER: GENERAL EXPERIMENTAL HEAT TRANSFER	HEAT TRANSFER: NUMERICAL FILM COOLING
	Impingement Cooling	**Experimental Investigation of Impingement Heat Transfer**	**Modelling Techniques for Film Cooling Numerical Simulation**
	Technical Session • A1-3 • FC-16-01	**Technical Session • A1-2 • FC-13-03**	**Technical Session • A1-4 + A1-5 • FC-12-06**
	Session Organizer: **Hongzhou Xu**, Solar Turbines Inc Session Co-Chair(s): **Qiang Zhang**, University of London	Session Organizer: **Forrest Ames**, Univ Of North Dakota Session Co-Chair(s): **Brett Barker**, Rolls-Royce	Session Organizer: **Malak Malak**, Honeywell International Session Co-Chair(s): **John Clark**, AFRL/RQTT
2:00	GT2018:75821 **Experimental And Numerical Investigation Of A Shower Head Advanced Jet Impingement On Concave Surfaces** ***Alankrita Singh**, Indian Institute Of Technology Madras; **Bhamidi V.S.S.S Prasad**, IIT Madras*	GT2018:76132 **Detailed Flow Analyses in Crossover Holes Between Two Adjacent Rib-Roughened Cooling Channels and the Resulting Impingement Heat Transfer** ***Mohammad Taslim**, **Fei xue**, Northeastern University*	GT2018:75444 **Applying Machine Learnt Explicit Algebraic Stress and Scalar Flux Models to a fundamental Trailing Edge Slot** ***Richard Sandberg**, **Raynold Tan**, **Jack Weatheritt**, **Andrew Ooi**, **Ali Haghiri**, University of Melbourne;* ***Vittorio Michelassi**, Baker Hughes a GE company;* ***Gregory Laskowski**, GE Aviation*
2:30	GT2018:76942 **Influeces of micro pin-fin on jet array impingement heat transfer: Effects of micro pin-fin shapes, height, and Reynolds Number.** ***Xunfeng Lu**, **Weihong LI**, **XUEYING LI**, **Jing Ren**, **Hongde Jiang**, Tsinghua University*	GT2018:76898 **ANNULAR HEAT TRANSFER ENHANCEMENT USING JET IMPINGEMENT** ***Andres Curbelo**, **Alex Hanhold**, **Cesar Lopez**, **Jayanta Kapat**, University of Central Florida; **Philippe Lott**, Ansaldo Energia; **Uwe Ruedel**, Ansaldo Energia Switzerland*	GT2018:75543 **CFD Simulations for Film Cooling Holes - Comparison between Different Isotropic and An-isotropic Eddy Viscosity Models** ***Jens Dickhoff**, **Karsten Kusterer**, **Santhosh Kumar Bhaskar**, B&B-AGEMA; **Dieter Bohn**, RWTH Aachen*
3:00	GT2018:77000 **Experimental and Numerical Analysis of Additively Manufactured Coupons with Parallel Channels and Inline Wall Jets.** ***Sarwesh Parbat**, **Li Yang**, **Zheng Min**, **Minking Chyu**, University of Pittsburgh*	GT2018:77036 **DOUBLE WALL COOLING OF A FULL COVERAGE EFFUSION PLATE WITH MAIN FLOW PRESSURE GRADIENT, INCLUDING INTERNAL IMPINGEMENT ARRAY COOLING** ***Sneha Reddy Vanga**, **Zhong Ren**, **Austin J. Click**, **Phil Ligrani**, Univ of Alabama In Huntsville;* ***Federico Liberatore**, **Rajeshriben Patel**, **Ram Srinivasan**, **Yin-hsiang Ho**, Solar Turbines*	GT2018:76927 **Physical Interpretation of Machine Learning Models Applied to Film Cooling Flows** ***Pedro M. Milani**, **John K. Eaton**, Stanford University; **Julia Ling**, Citrine Informatics*

OIL & GAS APPLICATIONS	STEAM TURBINES	STRUCTURES & DYNAMICS: BEARING & SEAL DYNAMICS
Dry Gas Seals and Panels: Design, Operation, and Maintenance Techniques for Improved Reliability	**Blade Vibrational Aspects**	**Seals 5**
Tutorial Session • Sør-Norge• FC-27-14	**Technical Session • Romerike • FC-29-05**	**Technical Session • E-8 • FC-34-14**
Session Chair: **Meera Day Towler**, Southwest Research Institute Session Co-Chair: **Timothy Allison**, Southwest Research Institute	Session Organizer: **Paul Petrie-Repar,** Department of Energy Technology, KTH Session Co-Chair(s): **Fabian F. Muller,** ITSM University Stuttgart	Session Organizer: **Martin J. Conlon,** Equispheres, Inc.
2:00 GT2018:77477 **Dry Gas Seals and Panels: Design, Operation, and Maintenance Techniques for Improved Reliability** ***Meera Day Towler, Timothy Allison,*** *Southwest Research Institute* **T U T O R I A L**	GT2018:76565 **On Possibilities Of Using Relative Shaft Vibration Signals For Rotating Blades Monitoring** ***Jindrich Liska, Vojtech Vasicek, Jan Jakl,*** *University of West Bohemia*	GT2018:75251 **Validation of CFD analysis method for seal dynamic coefficients with various labyrinth seal types** ***Makoto Iwasaki, Rimpei Kawashita, Yasunori Tokimasa, Kazuyuki Matsumoto, Makoto Kamishita,*** *Mitsubishi Heavy Industries;* ***Kenichi Murata,*** *Mitsubishi Hitachi Power Systems*
2:30	GT2018:76498 **Unsteady Flow Effects on Steam Turbine Last Stage Blades at Very Low Load Operating Condition** ***Tadashi Tanuma, Michio Ogawa,*** *Teikyo University;* ***Hiroshi Okuda, Gaku Hashimoto,*** *The University of Tokyo;* ***Naoki Shibukawa, Kenichi Okuno, Tomohiko Tsukuda,*** *Toshiba Corporation*	GT2018:75885 **Measurements of the Leakage and Rotordynamic Performance of Interlocking Labyrinth Seals** ***Keith Gary, Dara Childs,*** *Texas A & M Univ;* ***Mauricio Ramirez,*** *Hicor Technologies*
3:00	GT2018:75179 **Analysis of Steam Turbine Blade Tip Excitation Forces by Means of Computational Fluid Dynamics and Experimental Cascade Results** ***Stefan aus der Wiesche, Maximilian Passmann,*** *University of Applied Sciences Muenster*	GT2018:77131 **Development and Validation of Test Rig for Measurements of Leakage and Rotordynamic Performance of Interlocking Labyrinth Seals** ***Mauricio Ramirez, Keith Gary,*** *TEES Turbomachinery Lab;* ***Dara Childs,*** *Texas A & M Univ*

	STRUCTURES & DYNAMICS: EMERGING METHODS IN DESIGN & ENGINEERING	STRUCTURES & DYNAMICS: FATIGUE, FRACTURE & LIFE PREDICTION	STRUCTURES & DYNAMICS: ROTORDYNAMICS
	Emerging Methods in Structural System Design	**Damage Tolerant Analysis in Turbomachinery**	**Rotordynamics II - Model Improvements 2**
	Technical Session • E-6 • FC-30-02	**Tutorial Session • Event Room • FC-31-07**	**Technical Session • E-7 • FC-33-06**
	Session Organizer: **Weizhe Wang**, Shanghai Jiao Tong University	Session Organizer: **Martin Hughes**, Siemens Industrial Turbomachinery Ltd.	Session Organizer: **Dierk Otto**, Rolls Royce Deutschland Ltd & Co KG
2:00	GT2018:75023 **DATA PROCESSING OF PULSATION SIGNALS OF A TURBINE BASED ON EMD AND TEAGER ENERGY OPERATOR** ***Fengli Wang,*** *Dalian Maritime University;* ***Hua Chen,*** *Marine Eng. College, Dalian Maritime University;* ***Aiguo Gu, Wei Hu,*** *Wuxi Cummins Turbo Technology Co. Ltd.*	GT2018:77466 **Damage tolerant analysis in turbomachinery, from basic concept to industrial application** ***Eric Wyart****, Cenaero*	GT2018:75326 **A Simple (1-Flexible Rotor) Model That Shows Bull Gear Runout as a Source of Subsynchronous, Lateral Vibration in Integrally Geared Compressor (IGC) Pinions** ***Dara Childs****,* ***Andrew Crandall,*** *Texas A&M University*
2:30	GT2018:76111 **Evaluation Method of Uncertainty of Reliability Calculation For Turbine Disk Life** ***Jiang Fan****,* ***GaoXiang Chen, XiuLi Shen****, BeiHang University;* ***Tianyi Fan****, Experimental School of Beihang University*	T U T O R I A L	GT2018:75145 **Effectiveness Testing of an Inverse Method for Balancing Non-linear Rotordynamic Systems** ***Sergio Guillermo Torres Cedillo, Jacinto Cortes Perez, Alberto Reyes Solis,*** *Centro Tecnologico Aragon, FES Aragon, Universidad Nacional Autonoma de Mexico (UNAM);* ***Philip Bonello, Ghaith Ghanim Hameed Al-Ghazal,*** *University of Manchester*
3:00			

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo Session Participant Index

Turbo Expo 2018 Schedule at a Glance

Sunday June 10	Monday June 11	Tuesday June 12	Wednesday June 13	Thursday June 14	Friday June 15
	Registration 7:00 a.m. – 5:30 p.m. *West Entrance*	**Registration** 7:00 a.m. – 6:30 p.m. *West Entrance*	**Registration** 7:00 a.m. – 6:30 p.m. *West Entrance*	**Registration** 7:00 a.m. – 5:30 p.m. *West Entrance*	**Registration** 7:00 a.m. – 3:00 p.m. *West Entrance*
	Speaker Ready Room 7:00 a.m. – 5:30 p.m. *Spitsbergen*	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m. *Spitsbergen*	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m. *Spitsbergen*	**Speaker Ready Room** 7:00 a.m. – 5:30 p.m. *Spitsbergen*	**Speaker Ready Room** 7:00 a.m. –3:30 p.m. *Spitsbergen*
	Session Participant Networking Coffee 7:00 – 7:45 a.m. *Hall C*	**Session Participant Networking Coffee** 7:00 – 7:45 a.m. *Hall C*	**Session Participant Networking Coffee** 7:00 – 7:45 a.m. *Hall C*	**Session Participant Networking Coffee** 7:00 – 7:45 a.m. *Hall C*	**Session Participant Networking Coffee** 7:00 – 7:45 a.m. *Hall C*
	Conference Sessions 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.	**Conference Sessions** 8:00 – 10:00 a.m.
	Coffee Break 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.	**Coffee Break** 10:00 – 10:15 a.m.
	Opening Session Turbo Expo Keynote Panel: MRO in the Light of Digitalization & Awards Program 10:15 a.m.– 12:15 p.m. *B4, Norway Trade Fairs*	**Plenary: Impact of Additive Manufacturing on Future Gas Turbine Engines and Parts** 10:15 a.m. – 11:10 a.m. *B4, Norway Trade Fairs* **Conference Sessions** 11:15 - 12:45 p.m.	**Plenary: The MRO Digital/Data Transformation** 10:15 a.m. – 11:10 a.m. *B4, Norway Trade Fairs* **Conference Sessions** 11:15 - 12:45 p.m.	**Conference Sessions** 10:15 a.m.– 12:15 p.m.	**Conference Sessions** 10:15 a.m.– 12:15 p.m.
Registration 12:00 – 6:00 p.m. *West Entrance, Norway Trade Fairs*		**Expo Open** 12:30 – 6:30 p.m. *Hall D*	**Expo Open** 12:30 – 6:30 p.m. *Hall D*	**Expo Open** 12:30 – 2:30 p.m. *Hall D*	
Speaker Ready Room 12:00 – 6:00 p.m. *Spitsbergen, Norway Trade Fairs*	**Opening Lunch** 12:30 – 2:00 p.m. *Hall C*	**Expo Lunch** 12:30 – 2:00 p.m. **Poster Session** 12:30 – 2:00 p.m. *Hall D*	**Expo Lunch** 12:30 – 2:00 p.m. *Hall D*	**Expo Lunch** 12:30 – 2:00 p.m. **Closing Ceremony** 1:30 p.m. *Hall D*	**Closing Lunch** 12:30 – 2:00 p.m. *Hall C*
Gas Turbine Segment Meeting 1:00 – 5:00 p.m. *Rogaland, Thon Hotel Arena*	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.	**Conference Sessions** 2:00 - 3:30 p.m.
	Coffee Break 3:30 – 4:00 p.m.	**Coffee Break** 3:30 – 4:00 p.m. *Hall D*	**Coffee Break** 3:30 – 4:00 p.m. *Hall D*	**Coffee Break** 3:30 – 4:00 p.m.	
	Conference Sessions 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	**Conference Sessions** 4:00 – 5:30 p.m.	
	Welcome Reception 6:00 – 7:30 p.m. *West Entrance, Norway Trade Fairs*	**Expo Hall Reception** 5:00 – 6:30 p.m. *Hall D*	**Expo Hall Reception** 5:00 – 6:30 p.m. *Hall D*		
Council of Chairs Meeting 6:00 – 7:30 p.m. *Svalbard, Thon Hotel Arena*		**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	**Committee Meetings** 6:00 – 7:30 p.m.	
		Women in Engineering Event/ Dinner 7:45 – 10:30 p.m.	**ECE/Student Mixer** 6:45 – 8:00 p.m.		

ANSYS®

Turbocharge Your Time to Market

With ANSYS world leading simulation solutions, you will design turbo products with the highest level of efficiency and durability, as well as the lowest emissions and noise.

Enjoy operational benefits and excellence including shorter product development time and costs.

We Take Your Products Faster to Market.

Booth #401

ansys.com