



# AWARDS PROGRAM

## ASME International Gas Turbine Institute

## THE AWARDS

2021

ASME R. Tom Sawyer Award

## 2019

ASME Gas Turbine Award

## 2021

Dedicated Service Award

2021 Scholar Award **2019** John P. Davis Award

## 2021

ASME IGTI Aircraft Engine Technology Award

2021 ASME IGTI Industrial Gas Turbine Technology Award

## 2021

ASME IGTI Dilip R. Ballal Early Career Engineer Award

## AWARD COMMITTEES



## Honors & Awards Committee

William T. Cousins CHAIR



## Aircraft Engine Technology Award Committee

Wilfried Visser CHAIR



## Industrial Gas Turbine Technology Award Committee

John Gülen CHAIB

## 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 Institute activity but must be marked by sustained forthright efforts.



## Dr. Robert Kielb

Professor of the Practice, Duke University

Professor Kielb has nearly 50 years academic, industrial and government research laboratory experience in turbomachinery propulsion. This consists of 8 years with the U. S. Air Force, 10 years with NASA Lewis Research Center, and 12 years with GE Aircraft Engines as Manager of Aeromechanics Technology. He has also been an Affiliated Professor at the Swedish Royal Institute of Technology (KTH) since 2008.

He is Director of the GUIde Consortium (11 companies, 5 universities and 2 government organizations) and Duke

Coordinator for the EU-funded THRUST MEng Program. He has authored or co-authored over one hundred technical papers, is a recipient of the ASME's Melville Award for substantial improvements in the understanding of turbine aeroelasticity, and has presented invited lectures worldwide.

He is a Fellow of the ASME and was Chair of the Board of Directors of the International Gas Turbine Institute, serving on the Board for 6 years. He has also served as Technical Program Chair for ASME Turbo Expo '96, Chair of the ASME Structures and Dynamics Committee, and Associate Editor of both the Journal of Turbomachinery and Journal of Engineering for Gas Turbines and Power.

## **2019** 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.

#### RECEIVING THE 2019 GAS TURBINE AWARD FOR THEIR PAPER:

"The Impact of Combustor Turbulence on Turbine Loss Mechanisms"



## Dr. Masha Folk

Rolls Royce Corp.

Dr. Masha Folk is a turbine aerodynamics specialist at Rolls-Royce Corporation. Masha first joined Rolls-Royce in 2010 on the graduate scheme, a selective two year training program during which she earned a Lean Six Sigma Green Belt certification. After completing the program, Masha joined the turbine aerodynamics group in Indianapolis where her responsibilities included design and analysis of turbine components using preliminary correlations and high fidelity computational simulations.

Her educational background includes a Bachelor of Science degree from The Ohio State University and a Master of Science degree from Purdue University, both in Aerospace Engineering. In 2014 she was accepted into the EPSRC Centre for Doctoral Training Program in Gas Turbine Aerodynamics at Cambridge under the supervision of Professor Rob Miller with support and funding from Rolls-Royce.

Masha's doctoral research at the Whittle Laboratory in Cambridge experimentally examined the impact of combustor turbulence on turbine loss mechanisms. Zonta International recognized her contribution to applied aerodynamics, awarding her the Amelia Earhart Fellowship. Upon completing her PhD, Masha returned to Rolls-Royce in Indianapolis where she currently specializes in combustor-turbine interaction and turbine loss analysis, and supports a number of fundamental research activities as well as on-going engine programs.

#### 2019 ASME GAS TURBINE AWARD (CONTINUED)



#### **Robert J. Miller** Professor of Aerothermal Technology, University of Cambridge

Rob Miller is Professor of Aerothermal technology at the University of Cambridge, he has served as the Director of the Whittle Laboratory and Director of the Rolls-Royce Whittle University Technology Centre. He obtained his M.Eng., D.Phil., and held a Research Fellowship, at the University of Oxford. His research focuses on the decarbonisation of the aerospace and power generation sectors. He is passionate about the practical applications of his research, holding 11 patents and working closely with industries such as Rolls-Royce, Mitsubishi Heavy

Industries, Siemens, and Dyson. In 2013 he set up and led the UK Engineering and Physical Sciences Research Council (EPSRC) Centre of Doctoral Training in Gas Turbine Aerodynamics. Robert is a Fellow of the Royal Aeronautical Society and a member of IGTI's Turbomachinery Committee. His honours include the Institution of Mechanical Engineers Thomas Hawksley Gold Medal 2010, the AIAA Air Breathing Propulsion Award 2008, a member of the team that was awarded the Royal Academy of Engineering President's Special Award for Pandemic Service 2020, the ASME IGTI Turbomachinery and Heat transfer Committee best paper award eight times, and the ASME Gas Turbine Award 2010, 2014 and 2015.



## Dr. John D. Coull

Senior Research Fellow, University of Oxford

Dr. John Coull is a Senior Research Fellow at the University of Oxford, having joined the faculty in 2019. His primary research interest is to understand the fundamental drivers of gas turbine performance, including the mechanisms of loss production in the main gas path, the cooling of life-limiting turbine components and multi-disciplinary problems such as combustor-turbine-interaction and manufacturing variability. He received his MEng from the University of Cambridge in 2005, and obtained his PhD at the Whittle

Laboratory in 2009. In 2010 he was appointed as Rolls-Royce Senior Research Fellow at Magdalene College, Cambridge, working closely with industry on applied aerodynamic and heat transfer problems. Dr. Coull also has a strong interest in developing aerodynamic and thermal measurement techniques, and co-founded a spin-out company in 2016 to develop Micro-Electro-Mechanical-System sensors for industrial, consumer and biomedical applications. Dr. Coull has authored over 20 journal publications to date and has 7 patents granted or applied for. He was the 2015 recipient of the ASME Dilip R. Balal Early Career Award and has won ASME IGTI Committee best paper awards in 2014 and 2019. An active member of ASME since 2007, he has acted as session chair and delivered technical workshops.

## 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.



## Dr. Damian Vogt

Director, Institute of Thermal Turbomachinery and Machinery Laboratory, University of Stuttgart

Prof. Damian Vogt obtained his Engineering Diploma degree in Mechanical Engineering at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. He then moved to Stockholm, Sweden, where he researched on flutter in turbomachines at the Royal Institute of Technology (KTH). After having received his PhD degree, he continued his journey on the aeromechanical track while closely working with industry and academia, which, among others, brought him to Duke University as a Visiting Scholar. In 2013, Prof. Vogt joined the

University of Stuttgart, Germany, on a tenured professor position in Thermal Turbomachinery. He currently is the Director of the Institute of Thermal Turbomachinery and Machinery Laboratory (ITSM) and serves as the Dean of Studies of the MSc program in Energy Engineering. While still having turbomachinery aeromechanics in all its appearances as his main research focus, the applications currently range from compressors working with various gases over steam turbines featuring multi-phase flows to radial turbomachines, in specific turbochargers.

For more than 20 years, Prof. Vogt has been active within the ASME International Gas Turbine Institute (IGTI), regularly participating at the annual ASME Turbo Expo Conferences as an author, speaker, reviewer and session organizer. In the last decade, he held several leadership positions within IGTI, among others in the Structures and Dynamics Committee and the Steam Turbine Committee, and served as the Technical Program Chair of the 2015 ASME Turbo Expo Conference in Montreal, Canada, as well as the Conference Chair of the 2018 ASME Turbo Expo Conference in Oslo, Norway. Prof. Vogt currently is a Member of the ASME Gas Turbine Segment Leadership Team and the IGTI Executive Committee, which he chaired during the last year. He also serves as an Associate Editor of the ASME Journal of Engineering for Gas Turbines and Power.

#### 2021 ASME DEDICATED SERVICE AWARD (CONTINUED)



## **Richard Dennis**

Technology Manager, U.S. Department of Energy's National Energy Technology Laboratory

Mr. Richard Dennis is currently the Technology Manager for Advanced Turbines and Supercritical Carbon Dioxide Power Cycle Programs at the U.S. Department of Energy's National Energy Technology Laboratory (NETL). These programs support US university, industry and U.S. national laboratory research, development and demonstration projects. Rich has a Bachelor and Master of Science degrees in Mechanical Engineering from West Virginia University.

From 1983 to 1992 Mr. Dennis worked in the on-site research group of NETL where he conducted research related to pressurized fluidized bed combustion, gasification and gas stream particulate

cleanup for advanced coal based power generation.

From 1993 to 2000 Mr. Dennis managed contracted research for the DOE Office of Fossil Energy in advanced fossil fuel power generation including coal combustion, gasification, fuel cells, and gas turbines. In 2002 Richard was selected as a Technology Manager.

Currently Richard is serving as the Technology Manager for Advanced Turbines and Supercritical Carbon Dioxide Power Cycles programs at NETL. Additionally, Richard was the 2018-19 leader of the American Society of Mechanical Engineers (ASME) Gas Turbine Segment (GTS) and in 2021 received the ASME International Gas Turbine Institute Industrial Gas Turbine Technology Award. Richard is an ASME Fellow.

## Scholar Award

The International Gas Turbine Institute Scholar Award is bestowed upon an individual who submits a learned and comprehensive paper that makes a significant and timely contribution to the science and practice of gas turbine engineering. The Scholar presents the award-winning paper as a lecture to an audience of his peers.



## Dr. Zoltan S. Spakovszky

Professor, Massachusetts Institute of Technology

Dr. Spakovszky is Professor of Aeronautics and Astronautics at the Massachusetts Institute of Technology and the director of the Gas Turbine Laboratory. He obtained his Dipl. Ing. degree in Mechanical Engineering from the Swiss Federal Institute of Technology (ETH) Zürich and his MS and Ph.D. degrees in Aeronautics and Astronautics from MIT.

Dr. Spakovszky's principal fields of interest include propulsion and energy conversion, internal flows in fluid machinery, compressor aerodynamics and stability, micro-fluidics and

rotordynamics, aero-acoustics, aircraft design for environment, and electrified aviation. He currently directs analytical and experimental research in these areas and teaches graduate and undergraduate courses in thermodynamics, propulsion and fluid mechanics, and aero-acoustics.

He has authored a large number of technical papers in refereed journals and has been awarded several ASME International Gas Turbine Institute best paper awards, the ASME Melville Medal, the ASME Gas Turbine Award, the ASME John P. Davis Award, a NASA Honor Award, several Aero-Astro Undergraduate Advising / Teaching Awards, and the Ruth and Joel Spira Award for Excellence in Teaching.

Dr. Spakovszky is a technical consultant to industry and government agencies, a Fellow of the ASME, a member of the ASME Gas Turbine Segment Leadership Team, an Associate Fellow of the AIAA, and served as the chair of the turbomachinery committee and review chair of the ASME International Gas Turbine Institute, and as an associate editor for the ASME Journal of Turbomachinery.

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.

Award

John P. Davis

#### RECEIVING THE 2019 JOHN P. DAVIS AWARD FOR THEIR PAPER:

GT2019-91039 "Fan Flow Field in an Installed Variable Pitch Fan Operating in Reverse Thrust for a Range of Aircraft Landing Speeds"



## Dr. David John Rajendran

Research Fellow, Rolls-Royce University Technology Centre

Dr. David John Rajendran specialises in aero systems design and analysis for future propulsion architectures. David graduated with distinction in his bachelor's degree in Aeronautical Engineering from Madras Institute of Technology, India. After his graduation, he worked at the Gas Turbine Research Establishment in the design and development of turbines for various applications. During this time, he received the Government of India Young Scientist Award in recognition for his work on turbine system

development. Thereafter, he enrolled in the Gas Turbine Technology Master's degree at Cranfield University. In his Master's programme, his research looked into the turbine aerodynamic behaviour in overspeed conditions for which he was awarded the Royal Aeronautical Society NE Rowe Award. He also received the Roy Fedden Memorial Prize for excellence in his graduate studies. Subsequently, he did his doctoral research within the Rolls-Royce University Technology Centre at Cranfield University where he explored the design space of using Variable Pitch Fans for reverse thrust in future efficient, environment friendly, civil gas turbines. Design schematics to improve various aspects of the reverse thrust system from the work are in the process of being filed as 6 patents. He has co-authored 4 journal articles and 16 conference publications on variable pitch fans, turbine overspeed aerodynamics and turbine aerodynamic design. He is also involved in integrated modelling of experimental facilities, exploration of unconventional flows, design code development for quick concept studies and multi-disciplinary optimization.

#### 2019 JOHN P. DAVIS AWARD (CONTINUED)



#### **Dr. Vassilios Pachidis**

#### Chartered Engineer & Fellow, IMechE

Prof Pachidis is a Chartered Engineer and Fellow of the IMechE. He holds a First Class MEng degree from The University of Liverpool, as well as an MSc and a PhD from Cranfield. He first joined Cranfield as a member of research staff in 2001.

Prof Pachidis manages an annual research portfolio of more than £3.5M which includes Clean Sky, Horizon2020, iUK, ATI and EPSRC programmes. He has more than 15 years of research experience in the areas of external and internal (turbomachinery) aerodynamics, fluid mechanics, propulsion system design and integration,

performance modelling and optimisation, thermal management, including the design and performance of bottoming cycles with supercritical CO<sub>2</sub> for power generation, environmental control and/or waste heat recovery.

He has more than 50 fully peer-reviewed journal and 90 fully peer-reviewed conference papers, plus 30 other publications. He has almost 20 years of experience in post-graduate teaching, learning and Continuous Professional Development. He has taught more than 700 postgraduates since 2002 and more than 150 Short Course delegates since 2006. He has supervised to date more than 150 MSc and more than 25 PhD programs to completion.

He acts as a referee for 7 high-impact journals and is an Associate Editor for the Journal of Global Power and Propulsion Society. He has continuously supported the ASME/IGTI since 2002, having acted as Session Organizer, Session Chair or Co-Chair and Reviewer for all annual Turbo Expo conferences since then, including Vice-chair of the 'Cycle Innovations Committee' between 2013 and 2015 and Chair between 2015 and 2017. He has won 6 ASME/IGTI Committee 'Best Paper' Awards since 2006.

## 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. Guillermo Paniagua

Professor, Purdue University

Guillermo Paniagua has pioneered innovative turbine research in transonic turbines and counter-rotating turbines. He demonstrated pulsating trailing edge blowing method to control shock waves and manage the base flow pressure. He invented a new generation of turbines that can operate under high supersonic inlet conditions: supersonic axial, supersonic radial outflow turbines, and bladeless axial turbines. Based on experimental studies of large variations in heat flux on the turbine rotor casing, he co-invented several turbine rotor over-tip concepts that resulted in three patents, enhancing

turbine efficiency.

After 18 years at the prestigious von Karman Institute, he joined Purdue in 2014 and founded the Purdue Experimental Turbine Aerothermal Lab, developing a tri-sonic turbine facility with modular test sections to enable TRL1 to 6. Professor Paniagua's research is encapsulated in 100 journal articles and 182 proceeding papers at leading conferences.

Prof. Paniagua holds an MSc in Electro-Mechanical Engineering (Spain), a Research Master from the von Karman Institute (Belgium), and a Ph.D. with highest distinction in Engineering from the Universite Libre de Bruxelles (Belgium). Since 2016 he is a Part-time Faculty Research Participant in the ORISE program at the National Energy Technology Laboratory.

## Industrial Gas Turbine Technology Award

For outstanding contributions and leadership in gas turbine combustion research and development in electric power generation industry.



## **Richard Dennis**

Technology Manager, U.S. Department of Energy's National Energy Technology Laboratory

Mr. Richard Dennis is currently the Technology Manager for Advanced Turbines and Supercritical Carbon Dioxide Power Cycle Programs at the U.S. Department of Energy's National Energy Technology Laboratory (NETL). These programs support US university, industry and U.S. national laboratory research, development and demonstration projects. Rich has a Bachelor and Master of Science degrees in Mechanical Engineering from West Virginia University.

From 1983 to 1992 Mr. Dennis worked in the on-site research group of NETL where he conducted research related to pressurized fluidized bed combustion, gasification and gas stream particulate cleanup for advanced coal based power generation.

From 1993 to 2000 Mr. Dennis managed contracted research for the DOE Office of Fossil Energy in advanced fossil fuel power generation including coal combustion, gasification, fuel cells, and gas turbines. In 2002 Richard was selected as a Technology Manager.

Currently Richard is serving as the Technology Manager for Advanced Turbines and Supercritical Carbon Dioxide Power Cycles programs at NETL. Additionally, Richard was the 2018-19 leader of the American Society of Mechanical Engineers (ASME) Gas Turbine Segment (GTS) and in 2021 received the ASME International Gas Turbine Institute Industrial Gas Turbine Technology Award. Richard is an ASME Fellow.

## 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.



Assistant Professor, Air Force Institute of Technology

Lt. Col. Brian T. Bohan, PhD., is currently an Assistant Professor of Aeronautical Engineering in the Graduate School of Engineering and Management at the Air Force Institute of Technology (AFIT) in Dayton, Ohio. He teaches graduate level classes in advanced turbomachinery, applied computational fluid dynamics, and aircraft design. His research is focused on compact gas-turbine combustion, gas-turbine engine controls, heat transfer, fluidic oscillating devices, and alternate methods

and materials for manufacturing turbomachinery. As an academic he has authored over 30 technical journal and conference publications, including 8 at IGTI and 9 in ASME Journals, and three self-published genealogy books. A new compact gas-turbine engine configuration he designed that is ideal for power generation is currently patent pending. He is also a peer-reviewer for IGTI conference papers and ASME Journals. He is a member of the Tau Beta Pi Engineering Honor Society, and Sigma Gamma Tau Aeronautical Engineering Honor Society.

Prior to his current position, Brian served as a test program manager in the guidance and navigation field in the 746th Test Squadron, a propulsion subject matter expert in a system program office in the Air Force Life Cycle Management Center, as a deputy branch chief, program manager, and researcher in the Air Force Research Laboratory's high and low speed aerodynamic configuration branches, and was a full-time student twice for his graduate degrees. Brian has served as a coach and mentor for aspiring engineers. He coached a FIRST Lego League Jr. team for elementary students in 2019. He was a mentor at several AFIT Engineers Week events, which is a hands-on program for students in grades 6-12 and covers a wide range of engineering disciplines. Through all of his assignments Brian has earned a number of awards and recognition including; the AFIT Commandant's Award for the most exceptional master's thesis in the graduating class, AIAA Research Excellence Award, Capt. Roland R. Obenland Annual Engineering Award, and was a member of the AFRL Turbine Engine Division Team of the Year, among others.

Brian received his bachelor of science in aeronautical engineering from Clarkson University in 2005, and his master's and doctorate in aeronautical engineering from the Air Force Institute of Technology in 2011 and 2018, respectively. He is also a graduate of the Air Force Squadron Officer School and Air Command and Staff College, and holds Air Force Acquisition Professional certifications in Systems Engineering and Test and Evaluation.

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## OUTGOING CHAIRS

The core of IGTI is its committees, and the members of those committees drive our excellence. We greatly appreciate those individuals who commit to leading these committees as chair and recognize their time, expertise and effort required to do the job. Thank you for your service from July 1, 2019 to June 30, 2021.

Christian Oliver Paschereit Combustion, Fuels & Emissions

Mario L. Ferrari Cycle Innovations

Francesco Melino Industrial & Cogeneration

Jeffrey S. Patterson Marine

Fabrizio Reale Microturbines, Turbochargers & Small Turbomachines

Klaus Brun Oil & Gas Applications Marco Astolfi ORC Power Systems

Markus Schatz Steam Turbine

**Grant Musgrove** Supercritical CO<sub>2</sub>

Dale Van Zante Turbomachinery

**Alessandro Bianchini** Wind Energy

Deepanshu Singh Student Advisory (JULY 1, 2020 - JUNE 30, 2021)

# ASME IGTI Committee BEST PAPERS

## **Aircraft Engine**

GT2020-14597: Towards Primary Breakup Simulation of a Complete Aircraft Nozzle at Realistic Aircraft Conditions Katharina Warncke, Amsini Sadiki, Max Staufer, Christian Hasse, Johannes Janicka

GT2020-14174: Flow Distortion Into the Core Engine for an Installed Variable Pitch Fan in Reverse Thrust Mode David John Rajendran, Vassilios Pachidis

### Ceramics

GT2020-15521: Fatigue Characterization of Sic/sic Ceramic Matrix Composites in Combustion Environment Ragavendra Prasad Panakarajupally, Joseph El Rassi, Manigandan Kannan, Gregory Morscher

## **Coal, Biomass & Alternative Fuels**

GT2020-14702: An Investigation of Fundamental Combustion Properties of the Oxygenated Fuels DME and OME John M. Ngugi, Marina Braun-Unkhoff, Sandra Richter, Clemens Naumann, Uwe Riedel

## **Combustion, Fuels, and Emissions**

GT2020-14564: Experimental Investigation of the Combustion Behavior of Single-Nozzle Liquid-Flox®-Based Burners on an Atmospheric Test Rig

Saeed Izadi, Jan Zanger, Oliver Kislat, Benedict Enderle, Felix Grimm, Peter Kutne, Manfred Aigner

GT2020-15460: Soot Emission Simulations of a Single Sector Model Combustor Using Incompletely Stirred Reactor Network Modeling Savvas Gkantonas, Jenna M. Foale, Andrea Giusti, Epaminondas Mastorakos

GT2020-14665: Analysis of Thermoacoustic Modes in Can-Annular Combustors Using Effective Bloch-Type Boundary Conditions Jakob von Saldern, Alessandro Orchini, Jonas Moeck

## Controls, Diagnostics, and Instrumentation

GT2020-15081: An Additively Manufactured Four Sensor Fast Response Aerodynamic Probe Alexandros C. Chasoglou, Panagiotis Tsirikoglou, Anestis I. Kalfas, Reza S. Abhari

GT2020-14748: Real Time Diagnostic Method of Gas Turbines Operating Under Transient Conditions in Hybrid Power Plants Elias Tsoutsanis, Moussa Hamadache, Roger Dixon

## **Cycle Innovations**

GT2020-15391: Aero Engine Concepts Beyond 2030: Part 1 – The Steam Injecting and Recovering Aero Engine Oliver Schmitz, Hermann Klingels, Petra Kufner

<u>GT2020-15634</u>: Recuperator performance assessment in humidified micro gas turbine applications using experimental data extended with preliminary support vector regression model analysis.

Ward De Paepe, Alessio Pappa, Diederik Coppitters, Marina Montero Carrerro, Panagiotis Tsirikoglou, Francesco Contino

## Education

<u>GT2020-14395</u>: Development of Web-Based Short Courses on Control, Diagnostics, and Instrumentation Ioanna Aslanidou, Valentina Zaccaria, Amare Fentaye, Konstantinos G. Kyprianidis

## **Electric Power**

<u>GT2020-15714</u>: Assessment of Current Capabilities and Near-Term Availability of Hydrogen-Fired Gas Turbines Considering a Low-Carbon Future David Noble, Leonard Angello, David Wu, Benjamin Emerson, Scott Sheppard, Tim Lieuwen

## Fans & Blowers

GT2020-15353: A Machine-Learnt Wall Function for Rotating Ducts Lorenzo Tieghi, Alessandro Corsini, Giovanni Delibra, Francesco Aldo Tucci

## Heat Transfer

GT2020-16129: Scaling Considerations for Thermal and Pressure Sensitive Paint Methods Used to Determine Adiabatic Effectiveness Luke J. McNamara, Jacob P. Fischer, James L. Rutledge, Marc D. Polanka

GT2020-16234: Exploring Applicability of Acoustic Heat Transfer Enhancement Across Various Perturbation Elements Tapish Agarwal, Maximilian Stratmann, Simon Julius, Beni Cukurel

GT2020-16103: Some Observations on the Computational Sensitivity of Rotating Cavity Flows *Tom Hickling, Li He* 

GT2020-14603: An Experimentally Validated Low Order Model of the Thermal Response of Double-Wall Effusion Cooling Systems for Hp Turbine Blades Alexander V. Murray, Peter T. Ireland, Eduardo Romero

### **Industrial and Cogeneration**

GT2020-14187: Complex Energy Networks Optimization: Part I – Development and Validation of a Software for Optimal Load Allocation Maria Alessandra Ancona, Michele Bianchi, Lisa Branchini, Andrea De Pascale, Francesco Melino, Antonio Peretto, Jessica Rosati

## **Manufacturing Materials & Metallurgy**

GT2020-14449: Durable Abrasive Tip Design for Single Crystal Turbine Blades Douglas Nagy, Robert Tollett

## Mircoturbines, Turbochargers, and Small Turbomachinery

GT2020-14428: Generation Mechanism of Broadband Whoosh Noise in an Automotive Turbocharger Centrifugal Compressor Rick Dehner, Pranav Sriganesh, Ahmet Selamet, Keith Miazgowicz

GT2020-15804: Theoretical and Experimental Investigation of a 36 Watt Radial-Inflow Steam Turbine With Partial-Admission Patrick Hubert Wagner, Jan Van Herle, Jürg Schiffmann

## **Oil & Gas Applications**

#### GT2020-15476: Deposition Pattern Analysis on a Fouled Multistage Test Compressor Alessio Suman, Alessandro Vulpio, Nicola Casari, Michele Pinelli, Rainer Kurz, Klaus Brun

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#### BEST PAPERS (CONTINUED)

#### **Steam Turbine**

#### GT2020-14813: Detection of Cracks in Turbomachinery Blades by Online Monitoring

Manish Kumar, Roger Heinig, Mark Cottrell, Christian Siewert, Henning Almstedt, Drew Feiner, Jerry Griffin

## GT2020-16064: Large Eddy Simulation of a Condensing Wet Steam Turbine Cascade

Pascal Post, Benjamin Winhart, Francesca Di Mare

### **Structures & Dynamics**

GT2020-14943: Pumping Loss of Shrouded Meshed Spur Gears Michael Hurrell, Jerzy Sawicki

### Supercritical CO2 Power Cycle

GT2020-15541: Part Load Strategy Definition and Annual Simulation for Small Size sCO2 Based Pulverized Coal Power Plant Marco Astolfi, Dario Alfani, Marco Binotti, Paolo Silva

## Turbomachinery

GT2020-14305: Aerodynamic Loading Considerations of a Three-Shaft Engine Compression System During Surge Jose Moreno, John Dodds, Christopher Sheaf, Fanzhou Zhao, Mehdi Vahdati

GT2020-15655: Dynamic Model Based Identification of Cavitation Compliance and Mass Flow Gain Factor in Rocket Engine Turbopump Inducers Yu Wan, Marco Manfredi, Angelo Pasini, Zoltán Spakovszky

GT2020-15157: Averaging for High Fidelity Modelling: Towards Large Eddy Simulations in Multi-Passage Multi-Row Configurations *L He* 

## Wind Energy

GT2020-15278: Comparison of Blind Diagnostic Indicators for Condition Monitoring of Wind Turbine Gearbox Bearings Konstantinos Gryllias, Alexandre Mauricio, Junyu Qi



## Young Engineer Turbo Expo Participation Award

**Amrita Basak** Pennsylvania State University

**Eva van Beurden** Cooll Sustainable Energy Solutions B.V

Xiao He Imperial College

**Richard Hollenbach** Duke University

**Nikola Kafedzhiyski** Siemens Energy AB

**Amit Kumar** Indian Institute of Technology Bombay **Marcel Otto** University of Central Floria

**Ajey Singh** Indian Institute of Technology Kharagpur

**Alberto Vannoni** University of Genoa

**Peter Warren** University of Central Floria

Tingcheng Wu Texas A&M University



## Student Advisory Committee Travel Award

**Hessein Ali** University of Central Florida

**Papa Aye Nyansafo Aye-Addo** Purdue University

Lakshya Bhatnagar Purdue University

**Simone Braccio** Université Savoie Mont Blanc

**Jaime Aaron Cano** University of Texas at El Paso Daniel Castillo Imperial College London

**Louis Edward Christensen** The Ohio State University

**Eric T DeShong** Pennsylvania State University

**Dimitra Eirini Diamantidou** Mälardalen University (MDH)

Hossein Ebrahimi University of Central Florida

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#### 2021 STUDENT ADVISORY COMMITTEE TRAVEL AWARD (CONTINUED)

**Ryan Douglas Edelson** Pennsylvania State University

Alfredo Fantetti Imperial College London

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

Benjamin Francolini McGill University

**Emmanuel Gabriel-Ohanu** University of Central Florida

Vipul Goyal University of Central Florida

Shreyas Hegde Duke University

**Richard Lee Hollenbach, III** Duke University

**Kristyn Blake Johnson** West Virginia University

**Mohammed Ibrahim Kittur** University of Malaya

**Brian Frederick Knisely** Pennsylvania State University

**Amit Kumar** Indian Institute of Technology Bombay, Mumbai

Austin Carl Matthews Georgia Institute of Technology

Andrea Notaristefano Politecnico di Milano

Antonio Escamilla Perejón University of Seville

Hien Minh Phan Univeristy of Oxford **CP Premchand** Indian Institute of Technology Bombay

Avinash Ambadas Renuke University of Genova, Italy

Alessandro Romei Politecnico di Milano

**Alexander J Rusted** The Pennsylvania State University

**Izzet Sahin** Texas A&M University

**Jainam Shah** Ahmedabad University

Aravind Chandh Velayuthapattnam Shanmugam Georgia Institute of Technology

**Ajey Singh** IIT Kharagpur

Spencer Jordan Sperling The Ohio State University

**Mohammed Aqeel Talikoti** Vesvesvaraya Technological University

Vamsi Krishna Undavalli Moscow Aviation Institute (National Research Univeristy)

**Peter Ove Warren** University of Central Florida

**Peter Hansen Wilkins** Pennsylvania State University

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Congratulations to all award recipients and thank you to all ASME IGTI committee award representatives whose work assists the honors and awards chair and the honors and awards committee.

