

GPPS | XI'AN21

Global Power &
Propulsion
TECHNICAL CONFERENCE

2022

APRIL 11th - 13th
XI'AN, CHINA

PROGRAM



VIRTUAL FORMAT

Version 10: 09/04/22

Welcome to GPPS Xi'an21



On behalf of the GPPS Xi'an21 Organizing Committee and the GPPS Executive Committee, we are very pleased to welcome you to the GPPS Xi'an21 virtual event. The GPPS Xi'an21 is jointly hosted by Northwestern Polytechnical University and Xi'an Jiaotong University. It was envisioned that the COVID-19 pandemic would have been under control. However, the pandemic situation has not ended as hoped. So the local committee and the Executive Committee decided to hold a full online meeting to avoid further delay.

Currently, we are experiencing a slow but more disastrous global climate change, which has already brought about many unprecedented natural disasters worldwide. Carbon dioxide emission is the globally recognized culprit of the global climate change. Ambitious carbon emission reduction targets have been set by the world's major economies. The power and propulsion community is faced with crucial challenges and opportunities. Under these circumstances, the GPPS conference provides a premier international platform for scientists and researchers to present their state of the art results for greener power and propulsion. Hopefully, it will provide the community excellent opportunities to strengthen collaboration between industry and academia through sharing of technical information, networking and trust building. This year, the review committee has accepted a record high number of 212 peer-reviewed papers, and 10 parallel technical paper sessions have been scheduled. The Organizing Committee has invited five world-known interdisciplinary keynote speakers from both academia and industry to provide in-depth and comprehensive insights into the latest research developments in the related fields.

As part of the GPPS Xi'an21 conference, a Turbomachinery CFD Workshop was hosted online on 15th December 2021 with more than 100 attendees. This is the 1st event of its kind presented by GPPS and a rare opportunity in the world-wide power and propulsion community. This unique workshop aims to improve users' trust in RANS turbomachinery solvers by conducting a validation and verification study on the TUDa transonic axial compressor. A virtual tour of the TUDa transonic compressor test facility and ten technical presentations were presented during the workshop, together with a further dataset release from ETH Zurich, TU Darmstadt, Seoul National University, and Beihang University, following the 1st dataset release in 2020.

Xi'an, the capital city of Shaanxi province, is a highland of science and education with more than 60 universities and colleges. It is the base of aerospace and power industries in the northwest China, and also the starting point of the ancient Silk Road. The perfect blending of modern industry and ancient culture is the charms of this historical city. It is very disappointing that we cannot welcome you to Xi'an this time. We sincerely hope that you can still enjoy the technical presentations, keynote speeches and virtual interactions with other attendees of this conference.

A handwritten signature in black ink, appearing to read "Zhenping Feng".

Prof. Zhenping Feng
GPPS Xi'an21 Conference Chair

A handwritten signature in black ink, appearing to read "Hong Yan".

Prof. Hong Yan
GPPS Xi'an21 Conference Chair

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GPPS Xi'an Organizing Committee



Conference Co-Chair:

Prof. Zhenping Feng

School of Energy and Power Engineering, Xi'an Jiaotong University

Dr. Feng is a professor at the Institute of Turbomachinery, School of Energy & Power Engineering, Xi'an Jiaotong University, where he received his academic degrees of BS, MS and Ph.D., respectively. He has been a visiting scholar at Institute of Space System, University of Stuttgart, Germany, from Nov. 1993 to Nov. 1994, and a DAAD visiting Professor at Propulsion Lab, Berlin University of Technology, Germany, in later 1998. His research interest covers various aspects of turbomachinery with a focus on aerodynamics and heat transfer.



Conference Co-Chair:

Prof. Hong Yan

School of Power and Energy, Northwestern Polytechnical University

Hong Yan, Professor and Vice Dean of School of Power & Energy at Northwestern Polytechnical University (NPU), received her Ph.D. in Aerospace Engineering from NPU in 1997. Then she conducted post-doctoral research in Tsinghua University. In 1999, she went to the United States and performed research at Rutgers University and Wright State University as a postdoctor, later becoming research professor. In 2011, she joined the faculty of NPU as a full Professor of Aerospace Engineering. She is an AIAA Associate Fellow.



Review Chair:

Prof. Francesco Contino

Institute of Mechanics, Materials and Civil Engineering, UCLouvain

Francesco Contino received his degree in electro-mechanical engineering from the UCLouvain in 2006. He has spent one year learning Chinese in Nankai University, Tianjin, China. He then performed his Ph.D. thesis at UCLouvain between 2007 and 2011 as a Research Fellow of the Fonds de la Recherche Scientifique – FNRS. In 2011-2012, he had a post-doc position at Université d'Orléans, where he worked on the impact of valerate esters on engine performances. In 2012, he joined the Vrije Universiteit Brussel as Assistant Professor. Then, in 2019, he was appointed at UCLouvain, where he is since 2020 Professor.



Review Co-Chair:

Prof. Anestis Kalfas

Mechanical Engineering Department, Aristotle University of Thessaloniki

Anestis Kalfas received his Ph.D. in Turbomachinery Aerodynamics from Cranfield University in 1994 and his Dipl.-Ing. Mech. Eng. Aristotle University of his native Thessaloniki. He worked as a Research Associate at the Whittle Lab., University of Cambridge and as an Aircraft Engineer at the Hellenic Air Force. He has been a Senior Scientist at the Turbomachinery Laboratory of the Swiss Federal Institute of Technology in Zurich, since July 2000 where he lectured in Turbomachinery Design.



Local Managing Co-Director:

Prof. Jun Li

School of Energy and Power Engineering, Xi'an Jiaotong University

Dr. Jun Li is a professor of Institute of Turbomachinery of Xi'an Jiaotong University in China. Dr. Li obtained his Bachelor and Doctor Degree of Engineering at Xi'an Jiaotong University at 1993 and 1998 respectively. Dr. Li conducted his Postdoctoral research at Kyoto Institute of Technology and Kyushu Institute of Technology from 1998 to 2002 in Japan. Dr. Li's research topics focus on the Advanced Rotating Sealing Technologies in Turbomachinery, Aerodynamics and Heat Transfer and Cooling Layouts of Gas Turbines, Specified Working Fluid Turbomachinery.



Local Managing Co-Director:

Prof. Dingxi Wang

School of Power and Energy, Northwestern Polytechnical University

Dingxi is currently a professor and head of the department of fluid machinery at school of Power and Energy, Northwestern Polytechnical University. He obtained his Bachelor degree and Master degree in engineering at Northwestern Polytechnical University in 2002 and 2005 respectively and his Ph.D. in computational fluid dynamics at University of Durham in 2009. He worked on turbomachinery aerodynamics and aeroelasticity as a senior engineer from July 2008 to May 2012 and a principal engineer from June 2012 to Dec 2015 at Siemens Industrial Turbomachinery Ltd in the UK. He joined Northwestern Polytechnical University in Jan 2016.

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Imperial College London, UK



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Interdisciplinary Keynotes Speakers



Title: The Challenge of Flow Measurement in Turbomachinery

Prof. Xiaoshu Cai: Head of the Institute of Particle & Two-phase Flow Measurement (IPTFM), University of Shanghai for Science & Technology

He received his PhD from the Shanghai Institute of Mechanical Engineering in 1991. His major research interest is particle sizing techniques, two-phase flow measurement techniques, environmental monitoring, combustion diagnosing and turbomachinery.



Title: Hydrogen and Civil Aviation Prospects and Implications

Prof. Pericles Pilidis: Head of Thermal Power & Propulsion, Cranfield University

Since his Ph.D. and MBA at Glasgow University, Prof. Pilidis has specialized in gas turbine design, performance, operations, maintenance, technoeconomic and environmental aspects of gas turbine engines for air, land, and sea. He started his career in the maintenance base of an airline, focusing on performance testing and maintenance policies.



Title: Building Digital Twins to Simulate Manufacturing Variation

Prof. Shahrokh Shahpar: Rolls-Royce Fellow, Aerothermal Design System

Research interests are in the area of the automatic design optimization. This includes, MDO Techniques, aero-thermal, aero-acoustic, aero-mechanical, Uncertain Quantification (UQ), and Robust Design. He specializes in turbo-machinery CFD methods, including Geometry (parametrization) and automatic meshing for complex geometry.



Title: Some Progress and Problems in Aeroacoustics

Prof. Xiaofeng Sun: Professor of Aerospace Engineering, Beihang University

His principal fields of interest include unsteady flows in turbomachines, vortex dynamics, and aeroacoustics. The work consists of experimental, theoretical, and computational investigations into vortex sound interactions, flow stabilities in compressors, control of blade flutter, and acoustic design of aero-engine nacelles as well as various strategies for fan and compressor noise reduction.



Title: Opportunities and Challenges in Material and Manufacturing Technologies for Developing Commercial Aero Engines in China

Dr. Yan Zhang: Director of Materials and Manufacturing Process Department at AECC CAE

Dr. Yan Zhang is currently the Deputy Director of Manufacturing Engineering Department at Commercial Aero Engines, Aero Engine Corporation of China (AECC CAE). She is also working as the Chief Manufacturing Engineer of the Wide-body Engine program, responsible for the development of advanced manufacturing technologies such as welding, coating, machining techniques.



**Join us in Greece on the
12th - 14th September 2022**

GPPS Chania22 Technical Conference 2022

We are pleased to announce that we will be returning to Chania in Crete for our 2022 Technical Conference on September 12-14, 2022.

After the 2020 technical conference was moved into a virtual format, we very much look forward to finally meeting you all on the beautiful greek island of Crete.

The theme of this event will be Shaping the Future by Climate-Neutral Power & Propulsion Technology. Our conferences aim to provide high-quality content, including parallel paper presentations, invited keynotes, tutorials, and dedicated sessions for the GPPS open-access geometries and data sets.

The GPPS technical conference Chania22 will be held at the Minoa Palace Resort, located close to Chania.

Conference Chair

Dr. Jochen Gier
MTU Aero Engines, Germany

Review Chair

Prof. Seung Jin Song
Seoul National University, South Korea

Review Co-Chair

Dr. Klaus Brun
Elliott Group, USA

Review Co-Chair

Prof. Mehdi Vahdati
Imperial College London, UK

Technical Keynote Speakers



Title: Slotting Treatment of the Vane Diffusers of Centrifugal Compressors

Prof. Hua Chen : Dalian Maritime University

Professor Hua Chen obtained his PhD degree from the now University of Manchester, England in 1990, and worked at Imperial College, London and Honeywell Turbo Technologies in UK. When he left Honeywell in 2013, he was Standard Executive of Honeywell Turbo Technologies and a senior principal engineer.



Title: Sustainable Energy Carriers for the Whole-energy Systems

Prof. Francesco Contino : UCLouvain

Francesco Contino received his degree in electro-mechanical engineering from the Université catholique de Louvain in 2006. He has spent one year learning Chinese in Nankai University, Tianjin, China. He then performed his Ph.D. thesis between 2007 and 2011 as a Research Fellow of the Fonds de la Recherche Scientifique - FNRS. In 2011-2012, he was in post-doc at Université d'Orléans. In 2012, he was appointed as Professor at Vrije Universiteit Brussel. Since 2019, he is Professor at UCLouvain.



Title: Machine Learning Applications in Gas Turbine Design, Analysis and Operability

Dr. Senthil Krishnababu : Siemens Energy

Dr. Senthil Krishnababu is currently employed by Siemens Energy Industrial Turbomachinery Ltd, UK as Group Leader for compressor aerodynamics and mechanical integrity. He is also an Advisory Key Expert within Siemens Energy for aeromechanics and a visiting professor of Applied Machine Learning at University of Lincoln.



Title: Aerothermal Investigations on the Turbine Endwall Regions

Prof. Jun Li : Xi'an Jiaotong University

Dr. Jun Li is a professor of Institute of Turbomachinery of Xi'an Jiaotong University in China. Dr. Li obtained his Bachelor and Doctor Degree of Engineering in Xi'an Jiaotong University at 1993 and 1998 respectively. Dr. Li conducted his Postdoctoral research at Kyoto Institute of Technology and Kyushu Institute of Technology from 1998 to 2002 in Japan.



Title: Shaped Hole Film Cooling Studies at NPU: Past and Future Challenges

Prof. Cunliang Liu : Northwestern Polytechnical University

Dr. Cunliang Liu, professor and Vice Dean of School of Power and Energy at Northwestern Polytechnical University, received his Bachelor Degree in Thermal Engineering in 2005, his Ph.D in Aeronautical and Astronautical Propulsion Theory and Engineering in 2009, both from Northwestern Polytechnical University.



Title: Intentional Mistuning: Action Mechanism and Key Parameters

Prof. Carlos Martel : Universidad Politécnica de Madrid

Carlos Martel is Professor of Aerospace Engineering at Universidad Politécnica de Madrid (Spain) since 2009, where he also completed his PhD in Applied Mathematics in 1995. His research activity started in the field of nonlinear dynamics and pattern formation applied to basic fluid mechanics problems (convection, water waves, boundary layer).



Title: Application of Machine Learning for Turbomachinery Predictions

Prof. Mehdi Vahdati : Imperial College London

His main research focus is the development of CFD algorithms, modeling fan blade flutter, turbine and compressor forced response, stall and surge modeling and aeroacoustic and aeroelastic phenomena. In practice, one of the main reasons for turbomachinery failure is vibration, and our work is directly relevant to the industry. Through modeling, the behavior and mitigating causes of engine failures lead to substantial increases in safety and reliability, provides energy-efficient environmental friendly benefits and significant cost savings.



Title: Five Years in the Making: From the Harmonic Balance Method to the Coupled Time and Passage Spectral Method

Prof. Dingxi Wang : Northwestern Polytechnical University

Dingxi obtained his Bachelor degree and Master degree in engineering at Northwestern Polytechnical University in 2002 and 2005 respectively and his PhD in computational fluid dynamics at University of Durham in 2009.



Title: Recent Progress of Detonation for Propulsion

Prof. Jian-Ping Wang : Peking University

Entering University of Science and Technology of China in 1980. Studying at Dept. Aerospace Engineering, Nagoya University by Scholarship of China. Obtained Ph. D. in 1991 and worked as assistant professor then. Scholar at National Aerospace Laboratory, Japan during 1994-1996.



Title: A Study on the Aerodynamic Noise Reduction with the Bionic Configuration Inspired by Nature

Prof.-Dr. Weiyang Qiao : Northwestern Polytechnical University

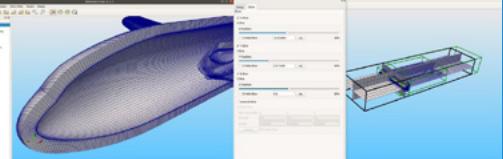
Prof.-Dr. Qiao Weiyang has more than 30 years experiences in unsteady flow, aeroacoustics and related fields, where he generally emphasizes the analysis of the unsteady flow field and sound field of turbomachinery and sound source localization with microphone array.

Conference Paper Sessions

Paper Sessions	Day	Page
CA: Axial Compressors	Monday, Tuesday, Wednesday	12, 13, 14, 15, 16, 17, 19, 20, 22, 23, 24, 25, 26, 27
CC: Combustor and Combustion	Monday, Tuesday, Wednesday	12, 13, 14, 15, 16, 17, 19, 20, 21, 23, 24, 25, 26, 28
CR: Radial Compressors	Monday, Tuesday	19, 20, 21, 25, 26
ESTR: Energy Transition and Renewables	Wednesday	27
FC: Flow control	Monday	14, 15, 16, 17
IT: Instrumentation & Testing	Monday	12, 13, 14, 15
MA: Mechanics: Acoustics	Tuesday	22, 23, 24
MD: Monitoring & Diagnostics	Monday, Wednesday	15, 16, 28
MUF: Mechanics: Unsteady Flows	Monday	12, 13, 14, 15
MI: Mechanics: Integrity	Tuesday, Wednesday	21, 22, 23, 24, 25, 26, 28
NMM: Numerical Methods: Modeling	Monday, Tuesday, Wednesday	14, 15, 16, 17, 19, 21, 22, 24, 25, 26, 27, 28
NMO: Numerical Methods: Optimization	Monday, Wednesday	14, 15, 16, 17, 20, 26
NMUQ: Numerical Methods: Uncertainty/Quantification	Monday	12, 13
SFND: Secondary Flow: Ducts & Nozzles	Tuesday	21, 22
SFC: Secondary Flow: Cooling	Monday, Tuesday, Wednesday	12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27
SFS: Secondary Flow: Sealing	Tuesday, Wednesday	23, 24, 25
T: Turbines	Monday, Tuesday, Wednesday	12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26
TCHT: Thermal Cycles & Heat Transfer	Tuesday, Wednesday	19, 21, 22, 23, 24, 27, 28



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MD Dr. Zhiyuan Cao Northwestern Polytechnical University	CA Prof. Juan Du Institute of Engineering Thermophysics	SFC Prof. Haiwang Li Beihang University	WT Prof. Mohammad Rahmati Northumbria University	CC Prof. Jing Ren Tsinghua University	CA Dr. Zhong-Nan Wang University of Birmingham	SFC Dr. Xing Yang Xi'an Jiaotong University
WT Prof. Philippe Chatelain UCLouvain	T, TCHT Dr. Penghao Duan University of Oxford	T Dr. Zhigang Li Xi'an Jiaotong University	ESTR Dr. Stefano Moret Imperial College London	TCHT Dr. Xiaodong Ren Tsinghua University	CA Dr. Zhiheng Wang Xi'an Jiaotong University	
NMM Dr. Fuzhen Chen Northwestern Polytechnical University	T Dr. Zhendong Guo Xi'an Jiaotong University	ESTR Dr. Fan Li Institute of Engineering Thermophysics, Chinese Academy of Sciences	MN, MA Prof. Hua Ouyang Shanghai Jiao Tong University	NMO Dr. Xinrong Su Tsinghua University	MUF, T Prof. Dingxi Wang Northwestern Polytechnical University	

Presenting Authors

Paper Number, Session Code | Surname, First Name

- 3, CC | **Chi, Cheng**
4, NMM | **Zhang, Sen**
5, T | **He, Lei**
7, T | **Liu, Yu Min**
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125, T | **Wu, Siyu**
130, T | **Hao, Zihan**
131, T | **Han, Xu**
132, SFC | **Wang, Kechen**
133, FC | **Guo, Yanchao**
135, CC | **Yang, Yang**
136, MD | **Jiang, Hao**
137, CC | **Shi, Xiaoxiang**
139, T | **Yao, Bochuan**
144, MA | **Zhang, Meijie**
145, NMO | **Ye, Yifan**
146, CC | **Liu, Zhigang**
- 148, IT | **Fan, Weihan**
149, TCHT | **Yang, Xuan**
153, T | **Jiang, Shijie**
154, CR | **Xu, Pengcheng**
155, T | **Li, Zhiyu**
156, CC | **Xie, Qing**
157, T | **Zhao, Tianxiao**
158, SFC | **Zhang, Xu**
159, NMUQ | **Zhu, Rui**
160, IT | **Xu, ShengMing**
162, CC | **Zhu, Ziru**
164, SFC | **Kong, Xiangcan**
165, SFC | **Hu, KeXin**
168, NMUQ | **Chen, Zeshuai**
170, SFDN | **Huang, Song**
171, T | **Wang, Rui**
172, CR | **Feng, Luwen**
173, CA | **Seidler, Marcel**
174, SFC | **He, Wenbin**
175, T | **He, Xiaojuan**
179, TCHT | **Pan, Ying**
181, T | **Huang, Tong**
182, MI | **Jia, Xinkai**
183, MD | **Li, Quankun**
184, CA | **Li, Lin**
188, FC | **Zhu, Huiling**
192, SFS | **Hösgen, Thomas**
193, NMM | **Yin, Junjie**
194, T | **Murat, Oguzhan**
195, MA | **Shao, Weidong**
203, SFC | **Shi, Jincheng**
209, ESTR | **Jurisic, Tin**
210, CA | **Rubini, Dylan**
211, MI | **Nasoulis, Christos**
213, MUF | **Kurth, Sebastian**
214, NMM | **Ahrens, Jan Dominik**
215, TCHT | **Gaitanis, Aggelos**
- 216, CA | **Xu, Ruize**
218, T | **Cui, Zhiwei**
221, SFC | **Wang, Shanyou**
225, NMO | **Guo, Zhendong**
228, SFC | **Cui, Xiaofeng**
231, SFC | **Liu, Pengmin**
233, MI | **Rong, Le**
235, NMM | **Liu, Yan**
237, CA | **Xue, Bo Wei**
240, CA | **Zhang, Xiawen**
241, NMO | **Hu, Handuo**
247, NMM | **Yang, Zhenyu**
250, CC | **Jin, Tai**
251, CC | **Jin, Ming**
252, CC | **Yin, Yu**
254, MA | **Liu, Qian**
256, SFC | **Wang, Xinxing**
257, SFC | **Zhang, Tiao**
258, TCHT | **Zhao, Jiazi**
260, CA | **Li, Yihan**
263, T | **Li, Feng**
265, SFC | **Yao, Min**
267, T | **Xie, Wenbo**
273, MI | **Gao, Qingzhe**
276, T | **Fan, Xin**
277, T | **Volkov, Andrew**
279, CA | **Liu, Yang**
283, CA | **Ren, Guanghui**
284, SFC | **Guo, Xinxin**
285, CC | **Pagani, Pietro**
286, MD | **Zieße, Mark**
287, CA | **Yan, Jiandong**
292, T | **Liu, Zhansheng**
293, SFC | **Cao, Feifei**
296, CA | **Zhao, Hongliang**
302, CC | **Liang, Hongxia**
303, SFC | **Wang, Wen**

GPPS Forum22

Aviation & Aerospace and the Energy Systems that run the world

Our signature event, GPPS Forum22, is approaching fast, and we look forward to meeting you all in person in Zurich on June 22nd-23rd, 2022.



Conference Chair
Prof. Reza Abhari



Our event program features renowned speakers in the areas of Aviation and Energy Systems. In panel sessions, we will discuss relevant topics and paths forward in dealing with current global challenges and trends in Power and Propulsion.

Due to our strict Covid-19 safety protocol, you will be able to attend in person and participate in our numerous networking opportunities and entertainment program freely.

The event registration will open soon. Save the date, join live, meet your colleagues, create new business opportunities, and become part of the GPPS community.

For more information regarding GPPS Forum22 please visit
www.gpps.global/gpps-forum22/

Aviation and Energy Systems

The GPPS Forum22 in Zurich will dedicate a day for a discussion of the major challenges facing the airline industry. This day will be focused on two significant subjects; the impact of commercial aviation on the environment and how coronavirus (COVID-19) has impacted the aviation industry.



The GPPS Forum is a place to exchange viewpoints, discuss new trends, network with experts, explore new opportunities as well as market threats. In June 2022, we will have one day dedicated specifically for the Energy Systems that run the world. The Energy Systems day will be split into three sequential sections, each with a different focus.



Detailed Schedule

Monday, April 11

Beijing Time → → → Zurich Time → → →

Presenter Setup Testing										
Opening Ceremony GPPS Xi'an21: Conference Co-Chairs:										
ROOM 1: Interdisciplinary Keynote										
Speaker: Dr. Yan Zhang (Director of Materials and Manufacturing Process Department at AECC CAE) Title: Opportunities and Challenges in Material and Manufacturing Technologies for Developing Commercial Aero Engines in China Session Chair: Prof. Cunliang Liu (Northwestern Polytechnical University)										
Room 1 CA Session Chair → Juan Du	Room 2 Session Chair → Penghao Duan	Room 3 CA Session Chair → Jinguang Yang	Room 4 T Session Chair → Jie Gao → Yuewen Jiang	Room 5 T Session Chair → Zhigang Li	Room 6 CC Session Chair → Yi Gao	Room 7 SFC Session Chair → Kun Du	Room 8 NMUQ Session Chair → Shenren Xu	Room 9 MUF Session Chair → Wenqiang Zhang	Room 10 IT Session Chair → Hua Ouyang	
13:30 ↓ 14:00 ↓ 14:30 ↓ 15:25 ↓ 15:45 ↓	[CA-009] Analysis of Rotating Instability in Axial Compressor Based on Dynamic Mode Decomposition → Bo Lian → Xiaojian Yang → Xiaocheng Zhu → Zhaohui Du Shanghai Jiao Tong University, China	Shaanxi Blower(Group) Co., Ltd Speaker: Shouhang Lu Title: Shaangu's research and application of digital twin technology in smart diagnosis of rotating machinery faults	[CA-364] Effect of Blade Loading Distribution on Flow Stability of Axial Compressor → Dengke Xu → Xu Dong → Dakun Sun* → Xiaofeng Sun Beihang University, China	[T-005] Research on optimal design of gas turbine blade tip cooling based on conjugate heat transfer method → Lei He ¹ → Yueru Li ¹ → Jinjie Zhao ¹ → Lianhui Zhao ¹ → Xiaocheng Zhu ² → Chaohui Du ² ¹ Shanghai Electric Gas Turbine Co.,Ltd., China ² Shanghai Jiaotong University, China	[T-063] Effects of partial suction side rim on the aerodynamics and heat transfer cooling performance of the turbine blade squealer tip → Chengtian Xu → Zhigang Li → Jun Li → Liming Song	[CC-058] Numerical Simulation of Primary Atomization of Swirling Liquid Sheet Using Transforming Algorithm → Qiyin Wang → Chao Zhou → Mostafa Moosania Peking University, China	[SFC-019] Improving The Film Cooling By Controlling The Vortex Structures → Xiaoliang Sun → Fuzhen Chen → Hong Yan Northwestern Polytechnical University	[NMUQ-059] Quantification of compressor aerodynamic performance deviation due to manufacturing uncertainty using the adjoint method → Qian Zhang ¹ → Shenren Xu ¹ → Xianjun Yu ² → Jiaxin Liu ² → Dingxi Wang ¹ → Xiuquan Huang ¹ ¹ Northwestern Polytechnical University, China ² Beihang University, China	[MUF-021] LES-Based Analysis of Unsteadiness and Instability of Tip-Leakage Vortex in Turbine Rotor → Zuojun Wei ¹ → Ming Ni ¹ → Guangming Ren ¹ → Lei Zhao ² ¹ Southern University of Science and Technology, China ² AECC Commercial Aircraft Engine Co., LTD, China	[IT-073] Experimental study on the uncertainties of individual blade vibrational parameter estimation based on blade tip timing → Zhicheng Xiao → Yiming Meng → Jianping Li → Chengwei Fan → Hua Ouyang Shanghai Jiao Tong University, China

Session Codes

CA: Axial Compressors | CC: Combustor and Combustion | CR: Radial Compressors | ESTR: Energy Transition & Renewables | FC: Flow control | IT: Instrumentation & Testing | MA: Mechanics: Acoustics | MD: Monitoring & Diagnostics | MI: Mechanics: Integrity | MUF: Mechanics: Unsteady Flows | NMM: Numerical Methods: Modeling | NMO: Numerical Methods: Optimization | NMUQ: Numerical Methods: Uncertainty/Quantification | SFC: Secondary Flow: Cooling | SFND: Secondary Flow: Ducts & Nozzles | SFS: Secondary Flow: Sealing | T: Turbines | TCHT: Thermal Cycles & Heat Transfer

Monday, April 11

Monday, April 11

Beijing Time → → → Zurich Time → → →

16:40
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10:55

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11:20

18:15
12:15

Coffee Break

Room 1 CA Session Chair → Juan Du	Room 2 Session Chair → Penghao Duan	Room 3 CA Session Chair → Jinguang Yang	Room 4 T Session Chair → Jie Gao → Yuwen Jiang	Room 5 T Session Chair → Zhigang Li	Room 6 CC Session Chair → Yi Gao	Room 7 SFC Session Chair → Kun Du	Room 8 FC Session Chair → Shenren Xu	Room 9 NMM Session Chair → Wenqiang Zhang	Room 10 IT/NMM Session Chair → Hua Ouyang
[CA-210] A New Robust Regenerative Turbo-Reactor Concept for Clean Hydrocarbon Cracking → Dylan Rubini ¹ → Liping Xu ² → Budimir Rosic ¹ → Nikolas Karefyllidis ¹ → Harry Johannesdahl ³ ¹ University of Oxford, UK ² University of Cambridge, UK ³ Coolbrook Oy, Finland	Northwestern Polytechnical University Speaker: Xiaochen Mao Title: Application of Surrogate Models of Loss and Deviation for Performance Prediction in Axial Flow Compressors	[CA-033] Aerodynamic improvement of the 16-stage axial compressor → Grigorii Popov ¹ → Maxim Miheev ¹ → Vasili Zubanov ¹ → Oleg Baturin ¹ → Evguenii Gorjachkin ¹ → Vladimir Nepomnyaschiy ² → Evguenii Fisher ² → Alexey Vorobyev ² ¹ Samara National Research University, Russia ² JSC Power Machines, Russia	[T-194] Experimental and Numerical Investigations of Mixed Convection in Turbine Cavities for More Flexible Operations → Oguzhan Murat ¹ → Budimir Rosic ¹ → Koichi Tanimoto ² → Ryo Egami ² ¹ University of Oxford, UK ² Mitsubishi Heavy Industries, Japan	[T-072] Investigation of Water Droplet Erosion in the Radial Turbine of a Fuel Cell Turbocharger → Tim Wittmann → Sebastian Lück → Christoph Bode → Jens Friedrichs Technische Universität Braunschweig, IFAS - Germany	[CC-003] Effect of detailed diffusion models on NO production in NH ₃ /H ₂ /air turbulent jet flames using Direct Numerical Simulations → Cheng Chi → Dominique Thévenin University of Magdeburg, Germany	Xi'an Jiaotong University Speaker: Kaiyuan Zhang Title: Turbine endwall film cooling and heat transfer characteristics with gap leakage flow control	[FC-308] Experimental validation of a corner stall control methodology using parametrised guide fins → Gabriel Mondin ¹ → William Riera ² → Pierre Duquesne ¹ → Xavier Ottavy ¹ ¹ University of Lyon, France ² Safran SA, France	[NMM-214] Immersed Boundary Method for the investigation of real surfaces with isotropic and anisotropic roughness components → Fangting Wang → Wu Zhou → Mingjun Feng University of Shanghai for Science and Technology, China	[IT-122] Application of particle streak velocimetry based on binocular vision in cascade flow channel → Fangting Wang → Wu Zhou → Mingjun Feng University of Shanghai for Science and Technology, China

ROOM 1: Interdisciplinary Keynote

Speaker: **Prof. Xiaoshu Cai** (Head of the Institute of Particle & Two-phase Flow Measurement (IPTFM), University of Shanghai for Science & Technology)

Title: **The Challenge of Flow Measurement in Turbomachinery**

Session Chair: **Prof. Hong Yan** (School of Power and Energy, Northwestern Polytechnical University)

Dinner/Lunch Break (including presenter setup testing)

Session Codes

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Monday, April 11

20:05
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Room 1 Session Chair → Pengfei Zhu	Room 2 CA Session Chair → Hao Wang	Room 3 CA Session Chair → Xiuquan Huang	Room 4 T Session Chair → Xin Yan	Room 5 T Session Chair → Chao Zhou	Room 6 CC Session Chair → Jin Tai	Room 7 SFS Session Chair → Jiang Lei → Jiahuan Cui	Room 8 MD FC Session Chair → Ruixian Ma → Xiaochen Mao	Room 9 NMO Session Chair → Wentao Ji	Room 10 NMM Session Chair → Wei Sun

20:30
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Coffee Break

Northwestern Polytechnical University Speaker: Qingchun Lei Title: Investigations of ignition process in an aeroengine model combustor via time-resolved 3D measurements	[CA-046] Effect of pulsed endwall injection on flow separation and vortex structure of a compressor cascade → Zhiyuan Cao → Cheng Song → Xi Gao → Xiang Zhang Northwestern Polytechnical University, China	[CA-081] A Method for the Characterization of Fans Down to Zero Speed and Analysis of Bypass Reverse Flow During Ground Start → Ferran Roig Tio → Hasani Azamar → Vassilios Pachidis Cranfield University, UK	Technical Keynote: T Speaker: Dr. Senthil Krishnababu (Siemens Energy) Title: Machine Learning Applications in Gas Turbine Design, Analysis and Operability	[T-013] Turbomachinery Analysis and Design Using Body-Force Modeling in SU2 → Evert Bunschoten TU Delft, Netherlands	[CC-146] Experimental and numerical investigation of jet velocity effects on MILD combustion characteristic of hydrogen-methane blending fuel → Zhigang Liu → Yan Xiong → Zhedian Zhang Chinese Academy of Sciences, China	[SFC-083] Numerical investigations into the effects of turning vanes on heat transfer and flow of a 2-pass ribbed internal cooling channel with a U-shape bend → Jiaxu Yao ¹ → Ruishan Lu ² → Jiang Lei ¹ → Pengfei Su ³ → Yu Fang ³ ¹ Xi'an Jiaotong University, China ² AVIC, China ³ Dongfang Turbine Co. Ltd., China	[FC-057] Research on the aero design system for the ultra-highly-loaded aspirated fan → Lei Wang ¹ → Bo Liu ² ¹ Xi'an ShaanGu Power, China ² Northwestern Polytechnical University, China	[NMO-145] Sequential ensemble multi-objective optimization algorithm and its application on the multi-working performance optimization of the variable cycle engine → Yifan Ye → Zhanxue Wang → Xiaobo Zhang Northwestern Polytechnical University, China	[NMM-025] Forced response analysis of the rotor blade rows with the ROM-based aeroelastic model → Jingyuan Yang → Weiwei Zhang Northwestern Polytechnical University, China
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Monday, April 11

《推进技术》简介

《推进技术》期刊 (Journal of Propulsion Technology) 创刊于 1980 年, 由中国航天科工集团有限公司主管、中国航天科工集团三十一研究所主办, 月刊, 面向国内外读者、作者, 在国内外公开发行, 是推进领域中具有重要学术影响力的专业期刊。

《推进技术》期刊的办刊宗旨为: 通过刊登国内和国际高水平的学术、技术论文, 促进航空、航天和航海推进科学技术领域高水平的学术交流, 推动航空、航天和航海推进科学技术事业的快速发展。

《推进技术》面向航空、航天和航海推进理论、实验和应用, 突出创新性, 内容涉及航空、航天和航海推进的各个领域, 重点刊载与涡轮喷气发动机、涡轮风扇发动机、超声速冲压发动机、高

超声速冲压发动机、水冲压发动机、固体火箭发动机、液体火箭发动机、爆震发动机、电推进、激光推进、核能推进、组合推进、新概念推进、舰船动力等相关的总体技术、进气道、压气机、涡轮、燃烧室、尾喷管、热防护、推进剂与燃料、燃烧、点火、流体力学、传热、固体力学、控制、热防护、试验与测量技术、故障诊断与监测、发动机制造技术等方面包括综述在内的研究论文。

自创刊以来, 《推进技术》期刊质量不断提高, 留下了许多科技工作者探索奋斗的足迹, 积淀了丰厚的科技财富, 出版精良, 深受广大读者喜爱和专家好评。《推进技术》早已成为中国自然科学核心期刊和中国科技论文统计源期刊之一, 是国务院学位委员会、国家教育委员会确定的学位与研究生教育中文重要期刊。



《推进技术》期刊被国内外许多著名检索系统收录

- 美国《工程索引》Ei 的核心检索
Ei Compendex 数据库
- 美国《剑桥科学文摘》CSA
- 美国《化学文摘》CA
- 美国《国际航空航天文摘》IAA
- 荷兰《文摘与引文数据库》Scopus
- 《北大中文核心期刊目录》
- 《中国科技期刊数据库》
- 《中国核心期刊(遴选)数据库》
- 《中国知网》
- 《中国期刊全文数据库》

《推进技术》期刊于 1991、1992、1996、2002 年 4 次荣获国家级期刊奖, 2002 至 2005 年连续 4 次被评选为“百种中国杰出学术期刊”, 2008 年荣获“中国精品科技期刊”称号, 2015 年、2017 年荣获由国家新闻出版广电总局组织评选的“百强报刊”称号, 成为唯一连续两届入选的航空航天类中文科技期刊。在中国航天期刊平台开展的首届优秀航天期刊奖及优秀期刊工作者奖评选活动中, 荣获优秀团队奖。2019 年, 入选“中国科协科技期刊卓越计划”项目。

崇尚科学、创新求实、客观公正和质量至上是《推进技术》期刊的生命所在。《推进技术》期刊继续致力于倡导优良学风和文风, 放眼世界, 力求在内容和形式上不断创新, 为航空航天推进技术领域的科技工作者提供和展示最新科研成果、探讨学科发展的顶级学术平台, 使期刊朝着质量精品化、内容专业化、编辑规范化、管理科学化的方向发展, 致力于打造精品期刊, 促进航空航天推进科学与技术的创新和发展。



《推进技术》
官方微信平台

主管单位 : 中国航天科工集团有限公司

主办单位 : 中国航天科工集团三十一研究所

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Presenter Setup Testing

ROOM 1: Sponsored Talk: **Dr. Yani Jia** (Vice General Manager of Shaanxi Blower (Group) Co., Ltd.)

Title: **Shaangu EIIS Solutions Provide Intelligent Green Energy for Human Civilization**

ROOM 1: Interdisciplinary Keynote

Speaker: **Prof. Pericles Pilidis** (Head of Thermal Power & Propulsion, Cranfield University)

Title: **Hydrogen and Civil Aviation Prospects and Implications**

Session Chair: **Prof. Zhenping Feng** (School of Energy and Power Engineering, Xi'an Jiaotong University)

Room 1 CA Session Chair → Zhiheng Wang → Zhu Huang	Room 2 Session Chair → Aqiang Lin → Wenjian Deng	Room 3 CA Session Chair → Xiaodong Ren	Room 4 T Session Chair → Min Zhang	Room 5 T Session Chair → Weihao Zhang	Room 6 CC Session Chair → Qingchun Lei	Room 7 SFC Session Chair → Dehai Kong	Room 8 CR Session Chair → Lei Zhang	Room 9 TCHT Session Chair → Yu Rao	Room 10 NMM Session Chair → Xinrong Su
[CA-089] Mechanism on the interactions of rotor tip flow with slot-type casing treatment in a transonic compressor stage → Zhidong Chi → Wuli Chu → Yaofeng Zhang → Ziyun Zhang → Haoguang Zhang Northwestern Polytechnical University, China	Rankyee Technology Speaker: Yang Zhang Title: Affordable supercomputing ability based on new generation computational fluid dynamics solutions	[CA-123] The mechanism of axial arrangement affecting the performance for tandem rotor with partial-height booster rotor in high-through-flow fan → Chuangxin Zhou → Shengfeng Zhao → Chengwu Yang → Ge Han → Xingen Lu Chinese Academy of Sciences, China	[T-116] Influence of Combustor Exit Conditions on Cooling Performance of NGV Endwall with Double Row Cooling Holes → Ruocheng Li ¹ → Wenhao Zhang ¹ → Zhiduo Wang ² → Zhihao Wang ¹ → ZhenpingFeng ¹ ¹ Xi'an Jiaotong University, China ² Xi'an Jiaotong University + Air Force Engineering University, China	[T-101] Experiment investigation on flow characteristics in a high speed rotor-stator cavity with axial air inflow → Ran Chang → Gaowen Liu → Tianheng Zha → Qing Feng Northwestern Polytechnical University, China	[CC-285] Assessment of Adaptive chemistry via pre-partitioning of composition space and mechanism reduction for the Simulation of MILD Combustion → Pietro Pagani ¹ → Francesco Contino ¹ → Alessandro Parente ² ¹ Université catholique de Louvain, Belgium ² Université libre de Bruxelles, Belgium	[SFC-158] Simultaneous Measurements of Velocity and Concentration Fields in An Inclined Jet in Crossflow → Xu Zhang → Shengwei Zhao → Chuangxin He → Yingzheng Liu → Wenwu Zhou Shanghai Jiao Tong University, China	[CR-014] Design and performance analysis of centrifugal compressor for supercritical carbon dioxide Brayton cycle → Gaoliang Liao → Qihan Zhang → Feng Zhang Hunan University, China	[TCHT-215] Towards real time transient mGT performance assessment: Effective prediction using accurate component modelling techniques → Angelos Gaitanis ¹ → Antoine Laterre ³ → Francesco Contino ³ → Ward De Paepe ² ¹ Université Catholique de Louvain & University of Mons , Belgium ² University of Mons , Belgium ³ Université Catholique de Louvain, Belgium	[NMM-088] Whole engine thermal analysis for calculation of clearances in a heavy-duty gas turbine → Hossein Shakeri → Mohsen Shokrollahi → Amir Poursamad MAPNA Turbine Engineering & Manufacturing Co., Iran

Session Codes

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Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8	Room 9	Room 10
<p style="text-align: right;">15:20 ↓ ↓ 09:20 ↓ ↓ 09:20 ↓</p> <p>[CA-184] The Effect of IGV Wake on Axial Compressor Rotor at Low Reynolds Numbers → Lin Li → Yanfeng Zhang → Ge Han Chinese Academy of Sciences, China</p>	<p>Xi'an Jiaotong University Speaker: Xiangyu Wang Title: Investigation on Numerical Method of Thermal-Fluid-Structure Coupling for Turbine Blades and Its Application</p>	<p>[CA-161] Influence of surface roughness on a highly loaded axial compressor stage performance at low Reynolds number → Hongzhi Cheng → Mingyang Wang → Chuangxin Zhou → Shengfeng Zhao → Xingen Lu → Junqiang Zhu Chinese Academy of Sciences , China</p>	<p>[T-124] Boundary layer separation control of low-pressure turbine blades based on oscillating jet → Zhou Luanliang → Jing Zifeng → Wen Xin → Liu Yingzheng → Kan Qin Shanghai Jiao Tong University, China</p>	<p>[T-105] A Fluid-Thermal Analysis of Partial Admission Axial Turbines → Hanwei Wang → Kai Luo → Qiushi Yang → Chuang Huang → Kan Qin Northwestern Polytechnical University, China</p>	<p>[CC-349] Automatic extraction of Chemical Reactor Networks from CFD data via advanced clustering algorithms → Matteo Savarese ¹ → Alessandro Parente ¹ → Ward De Paepe ² → Alberto Cuoci ³ ¹Université Libre de Bruxelles, Belgium ²Université de Mons, Belgium ³Politecnico of Milan, Italy</p>	<p>[SFC-164] Numerical Simulation on Internal Flow and Heat Transfer of Sweeping Jet and Film Composite Cooling on a Flat Plate → Kong Xiangcan → Zhang Ziqing → Li Guoqing → Zhang Yanfeng → Qingkuo Li → Ziqing Zhang → Yingjie Zhang → Ge Han → Yanfeng Zhang → Xingen Lu Chinese Academy of Sciences, China</p>	<p>[CR-031] Aerodynamic optimization for the vaned diffusers of an ultra-high-pressure-ratio centrifugal compressor based on an efficient machine learning algorithm → Xingen Lu</p>	<p>Technical Keynote: TCHT Speaker: Prof. Jun Li (Xi'an Jiaotong University) Title: Aerothermal Investigations on the Turbine Endwall Regions</p>	<p>[NMM-023] Development of Aspirated Ultra-Short Intakes for Aerodynamic Off-Design Analysis → Lennart Harjes → Jonas Grubert → Legin Benjamin → Constance Heykena → Jens Friedrichs Technische Universität Braunschweig - IFAS, Germany</p>
<p style="text-align: right;">15:45 ↓ ↓ 09:45 ↓ ↓ 09:45 ↓</p> <p>[CA-022] Stall inception analysis of a transonic compressor based on a global stability method → Xingao Xie → Zhengxian Liu → Xiaojian Li Tianjin University, China</p>	<p>Northwestern Polytechnical University Speaker: Sheng Huang Title: Investigation of structural response and fluid-thermo-solid coupling of a serpentine nozzle and integrated material-structure design</p>	<p>[CA-237] Influence of Leading Edge Erosion on the performance of transonic Fan Blade → Bo Wei Xue → Lei Shi Civil Aviation University of China, China</p>	<p>[T-125] Aerodynamic design and performance analysis of the ultra-high expansion ratio turbine for trans-media engines → Siyu Wu → Jie Gao → Cheng Zhou → Weiliang Fu Harbin Engineering University, China</p>	<p>[T-112] Optimum cooling performance of a multiple-jets impingement cooling system by controlling the inlet flow condition → Long Meng → Haiwang Li → Xie Gang → Zhiyu Zhou Beihang University, China</p>	<p>[CC-356] Feeding H₂ admixtures in a micro-Gas Turbine: a CFD study → Lorenzo Giuntini ¹ → Chiara Galletti ¹ → Alessandro Parente ² ¹Università di Pisa, Italy ²Université Libre de Bruxelles, Belgium</p>	<p>[SFC-165] Large-eddy simulation of shaped hole film cooling with the influence of streamwise pressure gradient → Kexin Hu → Qingsong Wang → Xinrong Su → Xin Yuan Tsinghua University, China</p>	<p>[CR-087] Numerical Investigations on Slip Characteristics and Slip Onset Position in High-Loaded Backswept Centrifugal Impellers → Chaowei Zhang ¹ → Xuezhi Dong ² → Xiyang Liu ² → Hualiang Zhang ³ ¹University of Shanghai for Science and Technology, China ²Tsinghua University, China ³Chinese Academy of Sciences, China</p>	<p>[NMM-316] Non-Intrusive Flow distortion measurements within a Turbofan Intake (NIFTI)-De-risking the test campaigns with CFD analysis → Wenqiang Zhang ¹ → Benedikt Tiedemann ² → Mehdi Vahdati ² → Fanzhou Zhao ² → Pavlos Zachos ³ → Sinus Hegen ⁴ ¹University of Nottingham, UK ²Imperial College London, UK ³Cranfield University, UK ⁴German-Dutch Wind Tunnel, Netherlands</p>	

Tuesday, April 12

16:10

Coffee Break

16:25

ROOM 1: Interdisciplinary Keynotes

Speaker: Prof. Xiaofeng Sun (Beihang University)
Title: Some Progress and Problems in Aeroacoustics
Session Chair: Prof. Jun Li (Xi'an Jiaotong University)

Room 1 CR Session Chair → Shenren Xu	Room 2 Session Chair → Dingxi Wang	Room 3 MI Session Chair → Weiling Zheng → Sheng Huang	Room 4 T Session Chair → Min Zhang	Room 5 T Session Chair → Weihao Zhang	Room 6 CC Session Chair → Qingchun Lei	Room 7 SFC Session Chair → Dehai Kong	Room 8 SFND Session Chair → Wenjian Deng → Lei Zhang	Room 9 TCHT Session Chair → Yu Rao	Room 10 NMM Session Chair → Xinrong Su
Technical Keynote: CR Speaker: Prof. Hua Chen (Dalian Maritime University) Title: Slotting Treatment of the Vane Diffusers of Centrifugal Compressors	Northwestern Polytechnical University Speaker: Fuzhen Chen Title: Research on basic problems of environmental adaptability of aeroengines	[MI-042] Flutter Analysis of Blisks with Friction Ring Dampers → Yekai Sun → Jie Yuan → Loic Salles Imperial College London, UK	[T-131] The influence of back pressure change on the leakage flow characteristics of the last stage blade tip clearance of steam turbine → Yunyun Yuan → Xu Han → Peng Li → Zhonghe Han North China Electric Power University. China	[CC-162] Effects of Inlet Air Temperature and Steam Addition on the Realization of MILD Combustion for Humid Air Turbine → Ziru Zhu → Yan Xiong → Zhedian Zhang Chinese Academy of Sciences , China	[SFC-199] The experimental study on the film cooling in the convergent-divergent nozzle with PSP technique → Feng Liu ¹ → Cunliang Liu ¹ → Zhao Ma ² → Tao Guo ¹	[SFND-038] Quantification of Swirl Distortions Caused by S-Shape Inlet Ducts → Zhenyu Li → Xu Dong → Dakun Sun → Xiaofeng Sun Beihang University, China	Northwestern Polytechnical University Speaker: Kun Du Title: Advancement in turbine endwall film cooling and thermal analysis of ceramic matrix composites	[NMM-109] Study on the Flow Characteristics of Fan Coupled Nacelle Intake under Different Angle of Attack → Min Qi → Zhanxue Wang → Li Zhou → Wenjian Deng	Northwestern Polytechnical University, China



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NMO: Numerical Methods: Optimization | **NMUQ:** Numerical Methods: Uncertainty/
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Room 1 Session Chair → Shenren Xu	Room 2 Session Chair → Dingxi Wang	Room 3 Session Chair → Weiling Zheng → Sheng Huang	Room 4 Session Chair → Min Zhang	Room 5 Session Chair → Weihao Zhang	Room 6 Session Chair → Qingchun Lei	Room 7 Session Chair → Dehai Kong	Room 8 Session Chair → Wenjian Deng → Lei Zhang	Room 9 Session Chair → Yu Rao	Room 10 Session Chair → Xinrong Su
17:45 ↓ ↓ ↓ ↓ ↓ 11:45 ↓ ↓ ↓	Xi'an Jiaotong University Speaker: Xing Yang Title: Particle Deposition Effects in Gas Engine Turbine	[MI-182] Effect of Fan Blade Vibration Mode on Flutter Stability → Xinkai Jia → Huang Huang → Dingxi Wang	[T-139] Effect of surface tension correction factor on non-equilibrium condensation flow of wet steam Northwestern Polytechnical University, China	[T-153] Numerical Investigations on the Unsteady Leakage Flow and Heat Transfer Characteristics of the Turbine Blade Squealer Tip North China Electric Power University, China		[SFC-203] PIV measurements of turbulent flows along the ribbed square duct under rotational condition Beihang University, China	[SFND-170] Numerical investigation of an aggressive s-shaped compressor transition duct with combined boundary layer suction Chinese Academy of Sciences, China	[TCHT-100] A theoretical investigation on thermal insulation of multilayer passive thermal protection system with carbon phenolic composites in combustion chamber → Xianlong Zhang → Yujia Bao → Cunliang Liu → Xiaohui Bai → Yuqing Wang	[NMM-117] Research On Aero Engine Intake Distortion Based On 3D CFD Full Engine Simulation → Yibing Xu → Wantong Wu → Wei Liu → Ying Piao
									Tsinghua University, China Northwestern Polytechnical University, China

Lunch/ Dinner Break (including presenter setup testing)

Tuesday, April 12

Room 1 Session Chair → Zhengang Liu	Room 2 Session Chair → Tianyu Pan	Room 3 Session Chair → Huang Huang	Room 4 Session Chair → Xianlong Meng	Room 5 Session Chair → Hanru Liu	Room 6 Session Chair → Yi Gao → Yinli Xiao	Room 7 Session Chair → Lifen Zhang	Room 8 Session Chair → Yanfeng Zhang	Room 9 Session Chair → Xiaohui Bai	Room 10 Session Chair → Min Yao
<p>19:35 ↓ ↓ 13:35 ↓ ↓ 14:00 ↓</p> <p>Xi'an Jiaotong University Speaker: Zhigang Li Title: Leakage and Fluid-induced Vibration Dynamic Characteristics of Rotating Seals in Turbomachinery</p>	<p>[CA-336] Study of Low Speed Modeling Method on Corner Separation Control Using Blade End Slots in a Highly Loaded Compressor Cascade</p> <p>→ Yantong Zhang → Yumeng Tang → Yangwei Liu</p> <p>Beihang University, China</p>	<p>[MI-354] Nonlinear Flutter Analysis of the Zero Nodal Diameter of a Labyrinth Seal</p> <p>→ Roque Corral → Michele Greco → Jose Luis Matabuena</p> <p>Universidad Politécnica de Madrid, Spain</p>	<p>[T-171] Effects of film hole diameter and wall thickness on overall cooling effectiveness of turbine vane leading edge</p> <p>→ Rui Wang → Cunliang Liu → Qihao Chen → Xianlong Meng</p> <p>Northwestern Polytechnical University, China</p>	<p>[MA-195] Prediction of engine intake noise with discontinuous least-square finite element method in frequency domain acoustics</p> <p>→ Weidong Shao → Bo Huang → Xinwen Zhang → Changchun Liu → Bing Lin</p> <p>AECC Commercial Aircraft Engine Co.,Ltd, China</p>	<p>[CC-252] Assessment of finite rate chemistry combustion models in a turbulent dilute ethanol spray flame</p> <p>→ Yu Yin → Tianwei Yang → Hua Zhou → Zhuyin Ren</p> <p>Tsinghua University, China</p>	<p>[SFC-303] Effects of hole arrangement and trenched hole on multi-row film cooling</p> <p>→ Wen Wang → Jiahuan Cui → Shaoxing Qu</p> <p>Zhejiang University, China</p>	<p>[SFS-339] Influence of Honeycomb Structures on Labyrinth Seal Aerodynamics</p> <p>→ Marcel Oettinger → Tim Kluge → Joerg Seume</p> <p>Leibniz University Hannover, Germany</p>	<p>Xi'an Jiaotong University Speaker: Zhiduo Wang Title: Study on flow and heat transfer mechanisms of high pressure turbine NGV under effects of non-uniform inflow</p>	<p>Technical Keynote: NMM Speaker: Prof. Dingxi Wang (Northwestern Polytechnical University) Title: Five Years in the Making: From the Harmonic Balance Method to the Coupled Time and Passage Spectral Method</p>
<p>20:00 ↓ ↓ 14:00 ↓ ↓</p> <p>Xi'an Jiaotong University Speaker: Xin Yan Title: Investigations on Rubbing Wear Damage and Performance Degradation of Labyrinth Seals</p> <p>1 National University of Defense Technology, China 2 China Aerodynamics Research & Development Center, China</p>	<p>[CA-300] Post-stall behavior of 2-stage compressor</p> <p>→ Ziwei Wang¹ → Bin Li² → Junbing Liu¹ → Jingfan Chen¹ → Yao Liu²</p> <p>Leibniz Universitaet Hannover, Germany</p>	<p>[MI-338] Influence of Axial Gaps on Forced Response of Different Mode Shapes in a Low-Pressure Compressor</p> <p>→ Hye Rim Kim → Dajan Mimic → Joerg R. Seume</p> <p>1 Xi'an Thermal Power Research Institute Co., Ltd., China 2 Xi'an Jiaotong University, China</p>	<p>[T-292] Design Optimization of the Convergent Passage Profile of a High-Load Turbine Vane Endwall</p> <p>→ Zhansheng Liu¹ → Junfeng Xiao¹ → Song Gao¹ → Yuanyuan Li¹ → Feilong Yu¹ → Jingyao Duan¹ → Zhenping Feng²</p>	<p>[MA-118] Experimental study on vortex sound interaction of acoustic resonance and its suppression in a flow duct</p> <p>→ Yilei Fu¹ → Jiaqi Zhang¹ → Zhiliang Hong¹ → Mingsui Yang²</p> <p>1 Civil Aviation University of China, China 2 AECC Shenyang Engine Research Institute, China</p>	<p>[CC-348] Analysis of combustion instability modes for a partially premixed swirl combustor by flame transfer function with the three-dimensional thermoacoustic model</p> <p>→ Enlei Ke → Ziyu Wang → Jiaying Cheng → Deng Pan → Tong Zhu → Chenzhen Ji</p> <p>Tongji University, China</p>	<p>[SFC-257] Experiment Study of Time-Resolved Film Cooling Effectiveness of Compound-Angled Fan-Shaped Film-Hole at Curved Wall</p> <p>→ Tiao Zhang → Jian Pu → Jian-Hua Wang</p> <p>University of Science and Technology of China, China</p>	<p>[SFS-192] Analysis of Wheel Space Ingress in a One-Stage Axial Turbine</p> <p>→ Thomas Hösgen → Matthias Meinke → Wolfgang Schröder</p> <p>RWTH Aachen University, China</p>	<p>[TCHT -258] Investigation of coupled radiation-conduction heat transfer in cylindrical systems by discontinuous spectral element method</p> <p>→ Jiazi Zhao → Yasong Sun → Yifan Li → Changhao Liu</p> <p>Northwestern Polytechnical University, China</p>	

Tuesday, April 12

20:25
14:25

Coffee Break

Room 1 Session Chair → Zhengang Liu	Room 2 Session Chair → Tianyu Pan	Room 3 Session Chair → Huang Huang	Room 4 Session Chair → Xianlong Meng	Room 5 Session Chair → Hanru Liu	Room 6 Session Chair → Yi Gao → Yinli Xiao	Room 7 Session Chair → Lifen Zhang	Room 8 Session Chair → Yanfeng Zhang	Room 9 Session Chair → Xiaohui Bai	Room 10 Session Chair → Min Yao
Hangzhou Steam Turbine Co., Ltd Speaker: Jibing Lan Title: Design and test verification of air-cooled turbine blades for heavy-duty gas turbines <small>→ Chenlei Huang¹ → Lei Shi¹ → Wenbo Wu¹ → Peng Yu¹ → Long Ma¹ → Qi Jiang²</small> <small>¹Civil Aviation University of China, China ²Xiamen Air, China</small>	[CA-319] Influence of fan rotor leading edge erosion on the flow characteristics of the compression system <small>→ Chenlei Huang¹ → Lei Shi¹ → Wenbo Wu¹ → Peng Yu¹ → Long Ma¹ → Qi Jiang²</small>	[MI-360] High fidelity finite element model updating and deviation characterization method for geometric mistuned bladed disks <small>→ Daosen Liang → Rui Zhang → Yulin Wu → Zichu Jia → Zhifu Cao → Jianyao Yao</small>	[T-276] Effects of Groove Structure on Aerodynamic Performance of a Turbine Blade <small>→ Xin Fan → Yan Hui Wu → Xiao Bing Zhou → Xin Guo</small>	[MA-144] Influence of Uneven Blade Tip Clearances on Aeroacoustic Characteristics of Centrifugal Compressors <small>→ Meijie Zhang → Mingxu Qi → Hong Zhang</small>	[CC-347] Investigations on the effects of flue gas recirculation on the combustion instability of a premixed flame for the low NOx emissions <small>→ Deng Pan → Tong Zhu → Chenzhen Ji</small>	[SFC-293] Experimental Study on Overall Cooling Effectiveness of Three-layer Laminate for Stealth Aircraft Tail Boom <small>→ Feifei Cao¹ → Wei Tan → Zhao Ma² → Cunliang Liu¹ → Chao Dong¹ → Tianliang Zhou¹</small>	[SFS-325] Investigation of staggered labyrinth tip shroud on flow mechanism of low-pressure turbine <small>→ Ning Sun → Qiu-Nan Yu → Wen-Tao Ji → Ya-Ling He → Wen-Quan Tao</small>	[TCHT-309] Numerical simulation of turbine blade internal and external heat transfer with the multi-layer coupling method <small>→ Dingxi Wang → Sen Zhang → Xiuquan Huang</small>	[NMM-oo4] Efficient Analysis of Unsteady Flows Within Multi-Stage Turbomachines Using the Coupled Time and Passage Spectral Method <small>→ Ning Sun → Qiu-Nan Yu → Wen-Tao Ji → Ya-Ling He → Wen-Quan Tao</small>

21:05
15:05

ROOM 1: Interdisciplinary Keynote

Speaker: **Prof. Shahrokh Shahpar** (Rolls-Royce Fellow, Aerothermal Design System, Rolls-Royce plc)

Title: **Building Digital Twins to Simulate Manufacturing Variation**

Session Chair: **Prof. Hong Xiao** (Northwestern Polytechnical University)

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13:30
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 07:30
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Presenter Setup Testing

Room 1 Session Chair → Lingling Chen	Room 2 CA Session Chair → Zhongnan Wang → Yan Liu	Room 3 T Session Chair → Jiaqi Luo → Shucheng Pan	Room 4 CC Session Chair → Qingchun Lei	Room 5 CR Session Chair → Weilin Yi	Room 6 SFC Session Chair → Zhao Liu	Room 7 MI Session Chair → Zhiyuan Cao → Quankun Li	Room 8 SFS Session Chair → Yanfeng Zhang	Room 9 NMO Session Chair → Yingxue Chen	Room 10 NMM Session Chair → Xiaobo Zhang → Shenren Xu
Northwestern Polytechnical University Speaker: Dehai Kong Title: Numerical study on flow and heat transfer characteristics of swirling flow on dimpled surfaces with effusion holes at turbine blade leading edge	[CA-216] Blade Tip Signal Analysis of An Axial Compressor → Ruize Xu → Jia Li → Xu Dong → Dakun Sun → Xiaofeng Sun → Congcong Chen Beihang University, China	[T-155] Effects of Anticlockwise Swirling Inflow on the Aerothermal Performance of the Turbine Vane Endwall with Film Cooling Layouts → Juan Wu → Kaiyuan Zhang → Zhiyu Li → Jun Li → Liming Song Xi'an Jiaotong University, China	[CC-200] Mode Shape and Eigenfrequency Analysis based on Helmholtz Equation for Thermo-acoustic Combustion Instability → Zi Liang Li → Xin Gen Lu → Juan Wu → Junqiang Zhu → Yipin Lu → Zuoqiang Chen → Sen Wang Northwestern Polytechnical University, China	[CR-096] Effects of impeller blades with bow trailing edge on centrifugal compressor performance → Shanyou Wang → Ge Han → Junqiang Zhu → Yipin Lu → Zuoqiang Chen → Sen Wang Chinese Academy of Sciences, China	[SFC-221] The effect of impingement-effusion cooling structure on adiabatic film effectiveness → Shanyou Wang → Xueying Li → Jing Ren Tsinghua University, China	[MI-211] Structural Optimization of the Wing Box for a Hybrid-Electric Commuter Aircraft → Zhuqing Yi ¹ → Christos Nasoulis ¹ → Panagiotis Tsirikoglou ² → Anestis Kalfas ¹ ¹ Aristotle University of Thessaloniki, Greece ² Limmat Scientific AG, Switzerland	[SFS-068] A 2D Axisymmetric Approach for Low Pressure Turbine Tip Sealing Design → Yuan Jin ² → Wenqi Xu ¹ → Olivier Jung ³ ¹ AECC, China ² BSS-Turbo-Tech-Ltd, China ³ Safran China, China	[NMO-332] Aerodynamic Rotor Blade Design for Small Wind Turbines with Focus on Turbulent Inflow Conditions → Matthias Schmid → Junjie Yin → Dingxi Wang ForWind, Leibniz Universität Hannover, China	[NMM-193] Investigation of a Wall-Distance-Free Spalart-Allmaras Turbulence Model for Turbomachinery Applications → Joerg Seume → Northwestern Polytechnical University, China
Xi'an Jiaotong University Speaker: Jiang Lei Title: Flow and heat transfer mechanism of gas turbine blade internal cooling by experiments	[CA-287] Experimental Investigation Of Circumferential Inlet Distortion On Partial Surge Type Stall Inception In A Transonic Axial Compressor → Jiandong Yan → Tianyuan Pan → Wengqian Wu → Qiushi Li Beihang University, China	[T-157] Comprehensive calculation and performance analysis of gas turbine reversible power turbine → Tianxiao Zhao ¹ → Jie Gao ¹ → Guojie Wang ² → Rui Yan ¹ ¹ Harbin Engineering University, China ² AVIC Commercial Aero Engine Co. Ltd, China	[CC-250] Hybrid Eulerian-Lagrangian simulations of liquid jet atomization in swirling cross flow → Tai Jin → Gaofeng Wang → Kun Luo → Jianren Fan Zhejiang University, China	[CR-152] Evolution of unsteady vortex structures and rotating stall cells in a centrifugal compressor with vaneless diffuser → Siya Jiang → Cheng Tian → Song Fu Tsinghua University, China	[SFC-228] Effects of streamwise vortices on the film cooling effectiveness of a fan-shaped hole → Xiaofeng Cui → Pengmin Liu → Chixiang Lin → Ren Dai University of Shanghai for Science and Technology, China	[MI-229] Study on structural Strength and Air-tightness Analysis of a large Axial Compressor Casing → Benzhuang Yue → Yuxin Liu → Xiaozhi Kong → Hua Chen → Huawei Lu Shaangu Power Co. Ltd, China	[SFS-104] The Effect of the Front Plate with Ribs on Brush Seal Flow Characteristics → Xiaolong Zhang Dalian Maritime University, China	[Xian Jiaotong University] Speaker: Zhi Tao Title: Aero-thermal Optimization and Uncertainty Quantification of Turbine Blade Non-axisymmetric Endwalls	[NMM-235] Machine Learning Based Design Optimization of Centrifugal Impellers → Ao Zhang ¹ → Yan Liu ² → Jinguang Yang ¹ → Zhi Li ¹ → Chuang Zhang ¹ → Yiwen Li ¹ ¹ Dalian University of Technology, China ² Shenyang Blower Works Group, China

Room 1 Session Chair → Sheng Huang → Weiling Zheng	Room 2 CA Session Chair → Yan Liu → Zhong-Nan Wang	Room 3 T Session Chair → Shucheng Pan → Jiaqi Luo	Room 4 CC Session Chair → Qingchun Lei	Room 5 MD Session Chair → Zhiyuan Cao → Quankun Li	Room 6 SFC Session Chair → Zhao Liu	Room 7 MI Session Chair → Xin Jing → Huang Huang	Room 8 ESTR Session Chair → Wenjun Gao	Room 9 TCHT Session Chair → Yasong Sun	Room 10 NMM Session Chair → Shenren Xu → Xiaobo Zhang
15:55 ↓ ↓ 09:55 ↓ Northwestern Polytechnical University Speaker: Junxing Tang Title: Numerical method for analyzing surface crack propagation considering the influence of residual stress	[CA-279] Effect of Circumferential Total pressure Distortion on Stability in an Axial Flow Compressor → Yang Liu → Jichao Li → Juan Du → Hongwu Zhang → Chaoqun Nie Chinese Academy of Sciences, China	[T-181] Influences of depth and rim width of squealer tip on the leakage flow and heat transfer → Tong Huang → Hui Li → Xinrong Su → Xin Yuan Tsinghua University, China			[SFC-265] Numerical Investigation of Different Turbulence Models Applied in Combined Impingement and Film Cooling → Min Yao → Jieli Wei → Zhuyin Ren → Xiaohua Gan Tsinghua University, China	Technical Keynote: MI Speaker: Prof. Carlos Martel (Universidad Politécnica de Madrid) Title: Intentional Mistuning: Action Mechanism and Key Parameters	[ESTR-037] Hybrid location-allocation algorithm for large scale energy system planning: A case study of the hydrogen supply chain in Belgium → Davide Tonelli ¹ → Alessandro Parente ² → Francesco Contino ¹ ¹ Université catholique de Louvain, Belgium ² Université Libre de Bruxelles, Belgium	[TCHT-149] The influence of working pressure on the heat transfer process and heat absorption of supercritical CO ₂ in thermoelectric conversion system → Guangyu Wang → Yumeng Tang → Yanfei Gao → Yangwei Liu Beihang University, China	[NMM-320] Evaluation of DDES Based on SST k-ω model with Different Shielding Functions for Tip Leakage Flow in Turbomachinery → Xuan Yang → Zhongwei Wang → Yaobin Niu → Heyang Miao National University of Defense Technology, China
16:20 ↓ ↓ 10:20 ↓ Northwestern Polytechnical University Speaker: Xin Jing Title: Modeling and simulation of the mechanical properties of ceramic matrix composites	[CA-283] Effects of Inlet Guide Vane Variability on Aerodynamic Performance of a 1.5-Stage Transonic Axial Compressor → Guanghui Ren ¹ → Shaojuan Geng ² → Hongwu Zhang ² → Xiaofang Wang ¹ → Jinguang Yang ¹ ¹ Dalian University of Technology, China ² Chinese Academy of Sciences, China	[T-218] Research on the influence of variable geometry power turbine speed adjustable on the overall performance of turboshaft engine → Weilin Yi → Zhiwei Cui Beijing Institute of Technology, China	[CC-302] Investigation on the Lean Blow-Out Characteristics in Concentric Staged Combustor → Hongxia Liang → Longyue Wang → Jianqin Suo Northwestern Polytechnical University, China	[MD-286] Data science-based trend analysis in research and development of turbomachinery → Mark Zieße → Joerg Seume Leibniz University Hannover, Germany	[SFC-284] Research status and development trend of rotating internal cooling of a gas turbine blade → Xinxin Guo → Xueying Li → Jing Ren Tsinghua University, China		[ESTR-209] Range of application for a self-sufficient energy system with hydrogen as energy carrier in remote areas → Ying Pan → Tin Jurisic ¹ → Sebastian Rehfeldt ¹ → Harald Klein ¹ → Michel Kneller ² ¹ Technical University of Munich, Germany ² ILF Beratende Ingenieure GmbH, Germany	[TCHT-179] Thermal analysis of high speed roller bearing based on partial power loss prediction → Wenjun Gao → Kun Li Northwestern Polytechnical University, China	[NMM-341] Assessment of RANS and SBES methods for the prediction of corner separation in axial flow compressors → Wei Sun Aero Engine Academy of China, China

Wednesday, April 13

Room 1	Room 2	Room 3	Room 4 Session Chair → Qingchun Lei	Room 5 Session Chair → Zhiyuan Cao → Quankun Li	Room 6	Room 7 Session Chair → Xin Jing → Huang Huang	Room 8	Room 9 Session Chair → Yasong Sun	Room 10 Session Chair → Shenren Xu → Xiaobo Zhang
16:45 ↳ ↳ ↳ 10:45 ↳ ↳ ↳			[CC-343] Effects of Scaling Laws on Flow and Combustion Characteristics of lean premixed swirl burners → Wenda Xie → Ting Shi → Bing Ge → Shusheng Zang Shanghai Jiao Tong University, China	[MD-326] Research progress of aero-engine gas-path fault diagnosis technology based on machine learning → Yanqiang Guo → Zhensheng Sun Rocket Force University of Engineering, China		[MI-330] Analysis of Structurally and Aerodynamically Mistuned Oscillating Bladerow Using Fully-Coupled Method → Hien Phan → Li He University of Oxford, UKZ		[TCHT-180] The Calculating of the Transient Temperature Field of the First Stage Segment Ring of a Gas Turbine → Wang Bo ¹ → Sui Yongfeng ¹ → Wei Jiaming ¹ → Chu Peng ¹ → Tu Yao ¹ → Chi Hongwei ² ¹ Hangzhou Steam Turbine & Power Group Co., Ltd., China ² Zhejiang Rancon Turbine Innovation Co., Ltd., China	[NMM-345] Unsteady analysis with through-flow concept → Yinbo Mao → Xinrong Su → Xin Yuan Tsinghua University, China

Closing Ceremony GPPS Xi'an21 (GPPS Best Paper Awards 2020)

[Ending 17:40] ↳ ↳ ↳

17:10 ↳ ↳ ↳
11:10 ↳ ↳ ↳
[Ending 11:40] ↳ ↳ ↳

GPPS Best Paper Awards 2020

Prof. Seung Jin Song (Vice-Chairman GPPS Executive Committee, Seoul National University)

Prof. Hong Yan (School of Power and Energy, Northwestern Polytechnical University)

Session Chair: Prof. Zhenping Feng (School of Energy and Power Engineering, Xi'an Jiaotong University)

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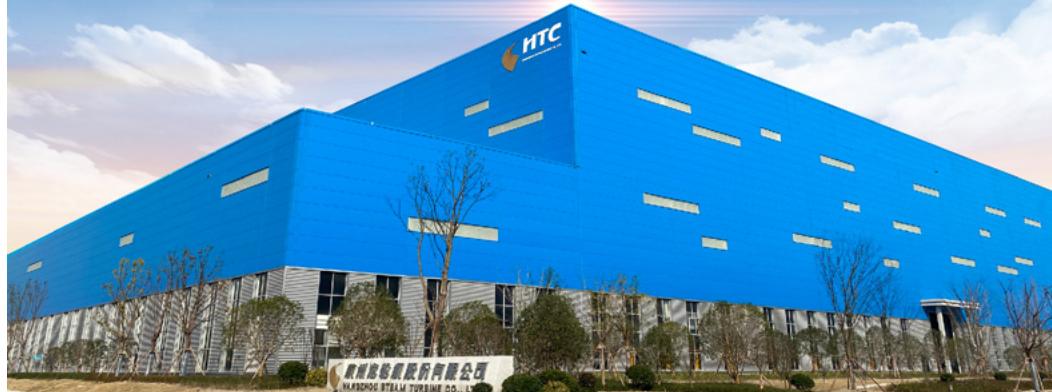
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驱动工业文明 永续中国动力
DRIVING INDUSTRIAL CIVILIZATION SUSTAINING CHINA POWER

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