

Conference Program

March 28-30, 2025 | Suzhou, CHINA | UTC+8

2025 8th International Conference on Aeronautical,
Aerospace and Mechanical Engineering (AAME 2025)

第八届航空航天与机械工程国际会议

Co-Sponsored by | 联合主办单位



苏州大学
SOOCHOW UNIVERSITY



南京航空航天大学
NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS



RMIT
UNIVERSITY

Assisted by | 协办单位



复旦大学
FUDAN UNIVERSITY



YORK
UNIVERSITY

扫描二维码查看会议现场图片直播



Jinling Nanlin Hotel Suzhou

苏州金陵南林饭店

Address: 20 Gunxiufang Shiquan Street Gusu District
Suzhou

苏州市十全街滚绣坊20号

■ TABLE OF CONTENTS

Organizing Committees	3
Conference Venue.....	5
Onsite Instruction.....	6
Online Instruction.....	7
Agenda on March 28	8
Agenda on March 29	9
Agenda on March 30	10
Keynote Speakers	12
Invited Speakers.....	14

Onsite Technical Sessions on March 29

Special Session 1A.....	19
Session 2	20
Session 3	21
Session 4	22
Session 5	23
Poster Session	24

Online Technical Sessions on March 30

Special Session 1B.....	26
Session 6	27
Session 7	28
Session 8	29

Delegate

Delegate.....	30
NOTE	31

■ CONFERENCE COMMITTEE

Conference Chairs

Prof. Yuehong Qian, Soochow University, China

Prof. John Mo, Royal Melbourne Institute of Technology, Australia

Conference Co-chair

Prof. Lixi Huang, The University of Hong Kong, Hong Kong, China

Prof. Yan Wang, Nanjing University of Aeronautics and Astronautics, China

Technical Program Chairs

Prof. Xin Zhang, Hong Kong University of Science and Technology, Hong Kong, China

Prof. Cees Bil, RMIT University, Australia

Prof. Zheng Hong Zhu, York University, Canada

Technical Program Co-chairs

Prof. Liming Yang, Nanjing University of Aeronautics and Astronautics, China

Prof. Chengwei Fei, Fudan University, China

Dr. Zhaolin Chen, Nanjing University of Aeronautics and Astronautics, China

Local Committees

Assoc. Prof. Jialin Lou, Soochow University, China

Dr. Yuxuan Chen, Soochow University, China

■ CONFERENCE COMMITTEE

Technical Committee Members

Prof. Gang Sun, Fudan University, China

Prof. Wenlin Wang, Dongguan University of Technology, China

Prof. Anika Zafiah Mohd Rus, Universiti Tun Hussein Onn Malaysia, Malaysia

Prof. Tai Yan Kam, National Yang Ming Chiao Tung University, Taiwan, China

Prof. Yuan Kang, Chung Yuan Christian University, Taiwan, China

Prof. Shyh-Chour Huang, National Kaohsiung University of Science and Technology, Taiwan, China

Prof. Madhan Arumugam Kumar, KFUPM campus Dhahran, Saudi Arabia

Assoc. Prof. Zhouteng Ye, Beihang University, China

Assoc. Prof. Dr. Kwek-Tze Tan, The University of Akron, USA

Assoc. Prof. Fufu Wang, Chinese Academy of Sciences, China

Assoc. Prof. Chrystal Zhang, Royal Melbourne Institute of Technology, Australia

Assoc. Prof. Jiang Ding, Guangxi University, China

Assoc. Prof. Cao Zhongchen, Tianjin University, China

Assoc. Prof. Baharudin B.T.H.T, Universiti Putra Malaysia, Malaysia

Assoc. Prof. Oscar Philander, Cape Peninsula University of Technology - Adaptronics Advanced Manufacturing Technology Laboratory, South Africa

Asst. Prof. Kuo Liu, Dalian University of Technology, China

Dr. Zhihui Liu, Tsinghua University, China

Dr. M S Yob, Universiti Teknikal Malaysia Melaka, Malaysia

Dr. Arvind Mukundan, National Chung Cheng University, Taiwan, China

Dr. Masoud Taghavi, Chung-Ang University (CAU) in Seoul, South Korea

Dr. S. M. Anas, Jamia Millia Islamia (A Central University), India

Dr. Anuj Kumar Shukla, NIT Raipur, India

Dr. Zohreh Molamohamadi, Kharazmi University, Iran

Dr. GUELAILIA Ahmed, Satellite development center, Algerian Space Agency, Algeria

■ CONFERENCE VENUE



金陵連鎖酒店

Jinling Hotels & Resorts

Jinling Nanlin Hotel Suzhou | 苏州金陵南林饭店

Address: 地址	20 Gunxiufang Shiquan Street Gusu District Suzhou 苏州市十全街滚绣坊20号
Note: 提示	The organizer won't provide accommodation, and we suggest you make an early reservation. 会议方不安排住宿，请自行提早进行预定。



Conference Rooms | 会议室安排

Sign-in | March 28, 2025

Spot:	Hotel Lobby, Building ①/1F 园中楼一楼大厅签到处
Time:	09:00-12:00, 13:30-17:00

Meeting Rooms

Date	Activity	Meeting Room
March 29, 2025	Opening Remarks & Keynote Speeches & Invited Speeches	3F, YuanXiangtang Convention Hall 园中楼远香堂
March 29, 2025	Lunch	1F, 山水楼怡然厅
March 29, 2025	Invited Speech & Special Session 1A & Session 4	2F, YaoHua Convention Room (A1), Building ① 园中楼二楼瑶华厅
March 29, 2025	Invited Speech & Session 2 & Session 5	2F, RuiYun Convention Room (A2), Building ① 园中楼二楼瑞云厅
March 29, 2025	Session 3 & Poster Session	2F, FuCui Convention Room (A5), Building ① 园中楼二楼浮翠厅
March 29, 2025	Dinner Banquet	3F, YuanXiangtang Convention Hall 园中楼远香堂

■ ONSITE INSTRUCTION

Oral Presentation 口头报告

1. Timing: a maximum of 15 minutes total, including speaking time and discussion. Please make sure your presentation is well timed.
2. You can use USB flash drive (memory stick). Each speaker is required to meet the session chair in the session rooms 10 minutes before the session starts and copy the slide file (PPT or PDF) to the computer.
3. It is suggested that you email a copy of your presentation to your personal inbox as a backup. If for some reason the files can't be accessed from your flash drive, you will be able to download them to the computer from your email.
4. Please note that each session room will be equipped with a LCD projector, screen, point device, microphone, and a laptop with general presentation software such as Microsoft PowerPoint and Adobe Reader. Please make sure that your files are compatible and readable with our operation system by using commonly used fonts and symbols. If you plan to use your own computer, please try the connection and make sure it works before your presentation.
5. Videos: If your PowerPoint files contain video clips please make sure that they are well formatted and connected to the main files.

Poster Presentation 海报展示

1. The poster must not exceed the **A0, 841 x 1189 mm, upright/portrait format**. The poster must be printed beforehand and brought along to the conference by the author.
2. Please use an appropriate font size for the posters so that they are readable by the participants from 1.5 meter away. The poster message should be clear and understandable even without oral explanation.
3. Set up your printed poster before your session start time on the day you are scheduled to present.
4. Poster presenters are required to stand by the poster during the scheduled duration of the poster session to answer questions from attendees.
5. Presenters must remove their printed posters immediately after the poster session.

Dress Code 着装要求

Please attend the conference in formal attire.

Conference Photos 会议照片

All the conference photos will be live streaming during the conference. Please scan the following QR code to access.



Safety Reminder: Secure Valuable Items at All Times 注意！请保管好个人物品

We remind you to secure your personal belongings at all times.

* Wear your Conference Identification Badge at all times. Do not throw away Badge.

请不要随意丢弃代表证，如您不需要，请归还至注册台。

* If you are using a laptop computer, do not leave it unattended at any time.

如果您使用笔记本电脑，不要置于无人看管。

* Keep your purse, wallet and other valuables with you at all times.

请随身携带贵重物品，不要随意放置在会议室内，以防丢失。

* The conference organizer will not be responsible for the loss or damage to any personal belongings.

会议组织者将不负任何个人物品的丢失或损坏。

■ ONLINE INSTRUCTION

Time Zone 时区

Beijing Time (UTC+8) 北京时间（东八区）

You're suggested to set up the time on your computer in advance.

Platform 平台

We will be using **Zoom** for all our live stream sessions. So, if you haven't installed it, please download a Zoom client from: <https://zoom.us/download>

会议全程使用**Zoom**在线进行，请提前下载好客户端: <https://zoom.com.cn/download>

The Zoom account is not mandatory to attend the conference. If you do not want to register the account, by entering meeting ID is also accessible to our conference.

Learn the Zoom skills at: <https://support.zoom.us/hc/en-us/articles/206618765-Zoom-Video-Tutorials>

Join the Test Session before the Formal Session 正式会议前的测试

Date: March 28th, 2025 时间: 2025年3月28日

Prior to the formal meeting, presenters shall join the test room to ensure everything is on the right track. Please check your test time on this program. 在正式会议之前，演讲者应加入测试室测试电脑、网络，了解在线会议的基本操作，以确保一切都能正常进行。请在日程上查看您的测试时间。

The Video presentation should be within 12 minutes, 3 minutes for Q&A, in total, one presentation is 15 minutes. 每个演讲者最多15分钟，其中3分钟用于问答。请确保您的演讲在规划的时间内。

Equipment Needed 所需设备

- * A computer with internet connection and camera
- * Headphones

Environment Needed 所需环境

- * Quiet Location
- * Stable internet connection
- * Proper lighting and background

Language 语言

- * Please make presentation in English.
- * Please feel free to discuss in English or Chinese during Q&A.

Attention Please 请注意

The conference will be recorded. We will appreciate your proper behavior.

Presentation Recording and Broadcasting 会议记录

The photograph(s) or video or audio recording(s) will be taken by conference organizer. It will be used in for conference program purpose. Each presentation will be recorded, if you don't want it, please inform our staff ahead of time.

Do not record other presenters' presentation nor distribute it to or share with anyone unless the presenter gives written consent of agree. Failure to do so will be considered a serious academic violation subject to disciplinary/ lawful action.

照片、视频或音频将由会议组织者记录，用于会议日程目的。每个演讲都会被记录下来，如果您不想被记录，请提前通知我们的工作人员。

除非演讲者书面同意，请勿录制他人的演讲，或将其分发给任何人或与他人共享，否则将负法律责任。

■ AGENDA ON MARCH 28

* All schedules will process in Beijing Time (UTC+8) 日程时间安排均为北京时间

Onsite Sign-in | 现场签到

Time	Activity	Venue
09:00-12:00 13:30-17:00	Sign-in and Conference Kits Collection for Onsite Participants <ul style="list-style-type: none"> Arrive at Registration desk Inform the staff of your paper ID Sign-in Claim your conference kit including conference bag, conference identification badge, meal coupon, conference program. 确保您收集齐以下会议资料：会议包，代表证，餐券，会议日程。	1F/Lobby, Building ① 园中楼一楼大厅签到处

Zoom Test for Online Participants | 线上会议测试

Time	Sessions	ZOOM ID & Link
10:00-12:00	Online Keynote and Invited Speaker Special Session 1B & Session 6 AA25-277 AA25-290 AA25-291 AA25-293 AA25-298 AA25-265 AA25-229 AA25-235 AA25-246 AA25-286 AA25-2101 AA25-260 Session 7 & Session 8 AA25-254 AA25-224 AA25-255 AA25-245 AA25-256 AA25-280 AA25-257 AA25-217 AA25-201 AA25-208 AA25-220 AA25-232 AA25-274 AA25-278 AA25-253	(Zoom ID: 849 3290 9499) https://us02web.zoom.us/j/84932909499

■ AGENDA ON MARCH 29

* All schedules will process in Beijing Time (UTC+8) 日程时间安排均为北京时间

Venue	Time	Activity
Host: Prof. John Mo , Royal Melbourne Institute of Technology, Australia		
3F YuanXiangtang Convention Hall Building ① 园中楼远香堂	08:50-08:55	Opening Remark Jiawei Wu , Vice President of Soochow University, China
	08:55-09:00	Welcome Address Prof. Yuehong Qian , Soochow University, China
	09:00-09:45	Keynote Speech I Prof. Lixi Huang , The University of Hong Kong, Hong Kong, China <i>"Sound Absorption with Impedance Gradient"</i>
	09:45-10:30	Keynote Speech II Prof. Zheng Hong (George) Zhu , York University, Canada <i>"Behavior-Based Swarm Control for Efficient Space Debris Removal"</i>
	10:30-11:00	Group Photo & Break Time
	11:00-11:30	Invited Speech I Prof. Gang Sun , Fudan University, China <i>"Graph structure embedded with physical constraints-based information fusion network for interpretable fault diagnosis of aero-engine"</i>
	11:30-12:00	Invited Speech II Assoc. Prof. Xuhui Li , Harbin Engineering University, China <i>"A Multiple-relaxation-times Regularized Lattice Boltzmann Collision Model: From Weakly Compressible to Compressible Flow"</i>
Lunch 12:00-13:00 午餐@山水楼怡然厅（1楼）		
2F YaoHua Convention Room (A1), Building ① 园中楼瑶华厅	2F RuiYun Convention Room (A2), Building ① 园中楼瑞云厅	2F FuCui Convention Room (A5), Building ① 园中楼浮翠厅
13:00-13:30	13:00-13:30	
Invited Speech III Prof. Lei Shi , Northwestern Polytechnical University, China <i>"High-Temperature Jet-Assisted Scramjet Combustion: Numerical Investigation of Low Dynamic Pressure Operation"</i>	Invited Speech IV Dr. Zhaolin Chen , Nanjing University of Aeronautics and Astronautics, China <i>"Experimental and Numerical Study on the Aerodynamic Performance of a Mars Counter-Rotor System"</i>	
13:30-15:30	13:30-15:30	13:30-15:00
Special Session 1A-Aerospace Power and Propulsion AA25-202, 268, 272, 209, 273, 296, 276, 267	Session 2-Dynamics Modeling and Fluid Mechanics Analysis in Aerospace Engineering AA25-222-A, 230-A, 264, 247, 2110, 294, 281, 212	Session 3-Aerospace Material Mechanical Properties Analysis and Modeling AA25-275, 258-A, 213, 210-A, 228-A, E32
15:30-15:45 Coffee Break		
15:45-17:45	15:45-17:30	16:00-17:00
Session 4-Avionics System Design and UAV Collaborative Control AA25-2106-A, 207, 223-A, E26-A, 237, 243, 218, E29-A	Session 5-Aircraft Structural Design and Safety Analysis AA25-236, 283, 269, 284, 250, E30, 219	Poster Session-Power Equipment Design, System Modeling, and Reliability Analysis in Aerospace Engineering AA25-266, 270, 249-A, 2103, 289, 2108, E28, E31-A, 2100, 2104, 292, 2109, 224-A, E25-A, 216-A, 221-A
Dinner Banquet@3F, YuanXiangtang Convention Hall, Building ① 18:00-20:00 晚宴及颁奖典礼@园中楼远香堂（3楼）		

■ AGENDA ON MARCH 30 (ONSITE)

* All schedules will process in Beijing Time (UTC+8) 日程时间安排均为北京时间

Campus Visit @ Soochow University

Time	Activity
09:20	Gather at School South Gate 苏州大学（天赐庄校区）南门
09:30-11:30	Campus Visit @ school museum 校博物馆及校园参观

Soochow University

苏州大学坐落于素有“人间天堂”之称的历史文化名城苏州，是国家“211工程”“2011计划”首批入列高校，是教育部与江苏省人民政府共建“双一流”建设高校、国家航天局共建高校，是江苏省属重点综合性大学。苏州大学前身是 **Soochow University**（东吴大学，1900年创办），开现代高等教育之先河，融中西文化之菁华，是中国最早以现代大学学科体系举办的大学。在中国高等教育史上，东吴大学是最早开展研究生教育并授予硕士学位、最先开展法学（英美法）专业教育，也是第一家创办学报的大学。1952年中国大陆院系调整，由东吴大学之文理学院、苏南文化教育学院、江南大学之数理系合并组建苏南师范学院，同年更名为江苏师范学院。1982年，学校更名苏州大学（**Soochow University**）。其后，苏州蚕桑专科学校（1995年）、苏州丝绸工学院（1997年）和苏州医学院（2000年）等相继并入苏州大学。从民国时期的群星璀璨，到共和国时代的开拓创新；从师范教育的文脉坚守，到综合性大学的战略转型与回归；从多校合并的跨越发展，到争创一流的重塑辉煌，苏州大学在中国高等教育史上留下了浓墨重彩的一笔。

一个多世纪以来，一代代苏大人始终秉承“养天地正气，法古今完人”之校训，坚守学术至上、学以致用，倡导自由开放、包容并蓄、追求卓越，坚持博学笃行、止于至善，致力于培育兼具“自由之精神、卓越之能力、独立之人格、社会之责任”的模范公民，在长期的办学过程中为社会输送了50多万名各类专业人才，包括许德珩、周谷城、费孝通、雷洁琼、孙起孟、赵朴初、钱伟长、董寅初、李政道、倪征日奥(yù)、郑辟疆、杨铁樑、查良镛（金庸）等一大批精英栋梁和社会名流；谈家桢、陈子元、郁铭芳、宋大祥、詹启敏等50多位两院院士，为国家建设与社会发展作出了重要贡献。

校园主要景观：

钟楼：位于校区中央，是苏州大学的标志性建筑之一。钟楼高耸，具有浓厚的欧式建筑风格，是校园内的地标性建筑。

红楼：原为东吴大学旧址，现为苏州大学博物馆。红楼建筑风格独特，融合了中西元素，具有重要的历史和文化价值。

文星阁：位于校园内，是一座古色古香的建筑，周围环境幽静，是学生和游客常去的景点之一。

尊师轩：一座具有传统中式风格的建筑，周围绿树成荫，环境优美，是校园内的一处静谧之地。

方塔：位于校园内，是一座古老的塔楼，具有悠久的历史，是校园内的重要文化遗产。

东吴大学旧址：包括多处历史建筑，如东吴大学校门、东吴大学礼堂等，这些建筑见证了苏州大学的历史变迁，具有重要的历史意义。

Soochow University Museum

在苏州大学天赐庄校区，巍然矗立的文星阁诉说着四百余年的茂苑骀宫与人物风华。从文星阁一路南行，途经红楼，穿过东吴老校门，就步入了全国重点文物保护单位——东吴大学旧址所在地。林堂、孙堂、子实堂、维格堂等民国楼宇相依相偎，势成呼应。中间怀抱之所，绿茵铺地，古木垂荫。东南方有座红砖建筑，呈南北“一”字形，典雅肃穆，这便是苏州大学博物馆，该馆址为建于20世纪30年代的东吴大学司马德体育馆。

苏州大学博物馆成立于2007年3月，2010年5月10日正式开馆，是华东地区知名的历史艺术类高校博物馆。展馆建筑总面积近6000平方米，共有展厅13个，现有藏品5633件（含文物3297件），涵盖书画、碑刻、石器、陶器、瓷器、铜器、银器、玉器、钱币、木雕、古籍、布艺、校史实物等类别，品类丰富，特色鲜明。

■ AGENDA ON MARCH 30 (ONLINE)

* All schedules will process in Beijing Time (UTC+8) 日程时间安排均为北京时间

Online Technical Sessions

ZOOM ID & Link

849 3290 9499

<https://us02web.zoom.us/j/84932909499>

Time	Sessions
09:00-10:15	Special Session 1B - Aerospace Power and Propulsion AA25-277 AA25-290 AA25-291 AA25-293 AA25-298 AA25-2102
10:30-12:15	Session 6 - Aviation Electronics Systems and Aviation Communication Technology AA25-265 AA25-229 AA25-235 AA25-246 AA25-286 AA25-2101 AA25-260
12:15-13:30	Lunch Break
13:30-14:00	Invited Speech V Assoc. Prof. Xiaodong Cai , National University of Defense Technology, China <i>"Detonation initiation in Nonuniform Supersonic Flows with Transverse fuel injection"</i>
14:00-15:45	Session 7 - Complex System Design and Functional Simulation Analysis AA25-254 AA25-224 AA25-255 AA25-245 AA25-256 AA25-280 AA25-257
16:00-18:00	Session 8 - Fault Detection and Dynamic Analysis of Aviation Power Machinery Equipment AA25-217 AA25-201 AA25-208 AA25-220 AA25-232 AA25-274 AA25-278 AA25-253

■ KEYNOTE SPEECH

Time:
09:00-09:45 | March 29, 2025

Venue: 3F, YuanXiangtang Convention Hall, Building ①
园中楼远香堂



Prof. Lixi Huang

黄立锡 教授, 香港大学

- 香港大学机械工程系副系主任
- 美国声学学会会士

Biography

Lixi Huang was born in Zhejiang province of China, educated at Beijing University of Aeronautics and Astronautics (BUAA) and University of Cambridge. His bachelor and master degrees from BUAA were in the field of aerospace engineering (jet propulsion), while the topic of his PhD study at Cambridge was theoretical acoustics and respiratory biomechanics (supervised by Prof JE Ffowcs Williams). He spent 8 years each in Beijing and Cambridge before coming to Hong Kong in 1996, initially at PolyU. After completing his PhD work in 1991, he worked as a research associate at the Whittle Lab (of turbomachinery), then as a college research fellow at Peterhouse, both within the University of Cambridge. His work on the mechanism of human snoring helped his medical/surgical colleagues devise a successful laser surgery procedure in the early 1990s, and the related pursuit in fluid mechanics touched upon the fundamentals of fluid-structure energy transfer mechanisms. Dr Huang is currently a full professor at HKU. He teaches dynamics (with application to space flight), thermodynamics, aeronautical engineering, and acoustics. He serves as a subject editor for Journal of Sound and Vibration and an associate editor for Journal of the Acoustical Society of America.

In 2012 Dr Huang joined a national basic research scheme (called “973” project in China). In the same year he became the chief scientist and director for the Lab of Aerodynamics and Acoustics (AA-Lab) at The University of Hong Kong Zhejiang Institute of Research and Innovation (HKU-ZIRI 香港大學浙江研究院), where information for student and postdoc applicants is posted.

Speech Title & Abstract

Sound Absorption with Impedance Gradient

In recent years, the so-called “acoustic black hole” (ABH) in ducts have attracted significant attention from researchers seeking to achieve perfect sound absorption. A typical ABH is constructed by placing annular rings with the sound passage radius decreasing gradually along the waveguide in order to slow down the propagating waves. Existing literature shows that there is significant sound reflection in realistic ABH designs. In this report, we focus on two issues: (i) is it appropriate to classify an idealistic terminal as “black hole”, and (ii) how does the typical retarding structure compare with other sound absorbers using pink noise as the incidence spectrum? Close examination of the difference between the assumed ABH wall impedance distribution and the actual structure design reveals that (a) the typical ABH structure does not support wave propagation and hence the “black hole” designation is inappropriate. (b) The sound absorption performance of the retarding structure is comparable but not as good as traditional acoustic wedge with the same porous material envelope as the so-called ABH.

■ KEYNOTE SPEECH



Time:
09:45-10:30 | March 29, 2025

Venue: 3F, YuanXiangtang Convention Hall, Building ①
园中楼远香堂



Prof. Zheng Hong (George) Zhu

朱正宏 教授, 约克大学

- Fellow of Canadian Academy of Engineering
- Fellow of the Engineering Institute of Canada

Biography

Dr. Zheng Hong (George) Zhu is Professor and Tier I York Research Chair in Space Technology in the Department of Mechanical Engineering, inaugural Academic Director of Research Commons in the Office of Vice-President Research & Innovation at York University. He received his BEng, MEng, PhD degrees in Applied Mechanics from Shanghai Jiao Tong University in China, MASc degree in Robotics from University of Waterloo and PhD degree in Mechanical Engineering from University of Toronto in Canada. From 1995-2006, he was senior stress/structural engineering at Indal Technologies Curtiss-Wright. He joined York University in 2006. Dr. Zhu has led multimillion dollar interdisciplinary research programs ranging from AI enhanced smart space robotics, to innovative propellant-free propulsion technology for deep space exploration, to active space debris removal, to dynamics and control of spacecraft. He is the Principal Investigator of two Canadian CubeSat missions. Career total, Dr. Zhu has published over 350 journal and conference papers and attracted \$15M+ from external funding agencies. Dr. Zhu is the College Member of the Royal Society of Canada; Academician of International Academy of Astronautics, Fellow of Canadian Academy of Canada, Fellow of Engineering Institute of Canada, Fellow of Canadian Society of Mechanical Engineering, Fellow of American Society of Mechanical Engineers, Associate Fellow of American Institute of Aeronautics and Astronautics, and senior Member of IEEE. He is the recipient of many prestigious awards including 2021 Robert W. Angus Medal by Canadian Society of Mechanical Engineering, 2019 PEO Engineering Medal in R&D by Professional Engineers Ontario, Canada.

Speech Title & Abstract

Behavior-Based Swarm Control for Efficient Space Debris Removal

Autonomous robotic active debris removal is essential for sustainable space utilization. This study introduces a novel approach using a swarm of small, simple spacecraft, such as CubeSats and Nanosats, with limited functionalities, contrasting with complex single-robot systems, to capture and deorbit unknown, uncooperative debris. Inspired by swarm intelligence in nature, the proposed architecture leverages behavior-based control for decentralized debris capture, enhancing robustness, flexibility, and cost-efficiency beyond what a single complex robotic system can achieve. Drawing from swarm behaviors observed in ant colonies and bird flocks, the control system employs a decentralized strategy where each spacecraft (agent) autonomously maneuvers using aggregation and flocking behaviors to approach the debris surface, while anti-flocking behavior optimizes agent distribution. This ensures comprehensive surface coverage and shape encapsulation before initiating capture. Additionally, agents possess some memory capacity, enabling synchronization of capture actions through local observations of debris landmarks and communication with neighboring agents. With a fully decentralized control system, all agents remain interchangeable, forming a leaderless, self-organizing multi-agent system. This swarm-based approach presents a scalable, efficient solution for capturing tumbling debris, advancing the field of active debris removal.

■ INVITED SPEECH

Time:
11:00-11:30 | March 29, 2025

Venue: 3F, YuanXiangtang Convention Hall, Building ①
园中楼远香堂



Prof. Gang Sun

孙刚 教授, 复旦大学

- 复旦大学航空航天系主任

Biography

Sun Gang, professor, doctoral supervisor, the current head of the Department of Aeronautics and Astronautics of Fudan University, the head of Fudan University in the joint construction of the "State Key Laboratory of Airliner Integration Technology and Flight Simulation", the Innovation Center for Engine Numerical Simulation with AECC Commercial Aero Engine Co., Ltd, the Joint Laboratory of Civil Aircraft/Engine Digital Flight Test with Shanghai Engineering Technology Research Center of Civil Aircraft Flight Testing, the editorial board member of some journals such as Journal of Aerodynamics, Applied Mechanics and Mathematics, Civil Aircraft Design and Research, Aeronautical Science and Technology, the senior writer and reviewer of top journals in the field of aviation and power, such as Aerospace Science and Technology, Journal of Aerospace Engineering, Chinese Journal of Aeronautics, and the member of many organizations such as the Teaching Steering Committee of the Ministry of Education, the Chinese Society of Aeronautics and Astronautics, the Academic Committee of the National Key Laboratory.

Research interests include complex flow mechanism, aerodynamic optimization and design of aircraft/engines, engine flow and overall performance simulation design, artificial intelligence and digital twin methods, aerodynamic noise calculation and noise reduction design, etc. Once participated in the development of ARJ21-700, C919, C929, CJ-1000, CJ-2000 and other major national projects. Research results have been tracked and evaluated by many well-known scholars. So far has published more than 300 papers and conference reports, and won 5 provincial and ministerial science and technology awards.

Speech Title & Abstract

Graph structure embedded with physical constraints-based information fusion network for interpretable fault diagnosis of aero-engine

Fault diagnosis is essential for ensuring the safety and reliability of aero-engines. Current performance-based fault diagnosis methods typically establish a mapping between measurable parameters and engine states, without taking into account the inherent physical constraints of multimodal information. In this study, a novel graph structure embedded with physical constraints is proposed to effectively fuse sensor information and physical-based model (PBM) simulation information. Since the fault information is primarily manifested in the sensor data rather than the PBM data, the probability distribution between these two types of data can serve as a constraint for constructing the edges in the graph, as it reflects the physical association among the sample points. Selected sensor parameters are used as node characteristics in the graph. A self-supervised representation learning training structure based on graph convolutional network and canonical correlation analysis can effectively utilize labeled and unlabeled data. Furthermore, a robust statistics method is embedded into the training architecture to interpret the behavior of the model by identifying the impact of data samples. The verification results indicate that the proposed model can effectively perform multimodal information fusion and achieve more efficient and high-accuracy component-level fault diagnosis.

■ INVITED SPEECH

Time:
11:30-12:00 | March 29, 2025

Venue: 3F, YuanXiangtang Convention Hall, Building ①
园中楼远香堂



Assoc. Prof. Xuhui Li

李旭晖 副教授，哈尔滨工程大学

- Harbin Engineering University, China

Biography

Xuhui Li is an associate professor at Harbin Engineering University. He obtained his Ph.D. degree from Kyushu University (Japan) in 2016, and conducted postdoctoral research at Ecole Centrale Nantes (France) and Southern University of Science and Technology (China) from 2016 to 2020. Currently, his research primarily focuses on computational fluid dynamics in naval architecture and ocean engineering, particularly involving the theory, algorithms, and GPU parallel computing of the lattice Boltzmann method and high-order finite volume method, as well as their applications in complex free-surface flows, cavitation, noise and related fields. He has presided over more than 10 projects, including the National Natural Science Foundation of China General Program, and has published over 20 papers.

Speech Title & Abstract

A Multiple-relaxation-times Regularized Lattice Boltzmann Collision Model: From Weakly Compressible to Compressible Flow

In the present work, a regularized lattice Boltzmann collision model is proposed. In the proposed collision model, only the moment or moment combination which are of translational invariance and rotational invariance can be distributed an independent relaxation rate. This constraint or principal realized the rigorous independent relaxation process of different transport phenomena. Recently, this regularized lattice Boltzmann collision model with multiple-relaxation-times (RLB-MRT) has been extended to multiphase/multicomponent lattice Boltzmann models, such as Shan-Chen model and Phase field model, which can be applied in the cavitation flow and free surface flow.

■ INVITED SPEECH

Time:
13:00-13:30 | March 29, 2025

Venue: 3F, YaoHua Convention Room (A1), Building ①
园中楼瑶华厅



Prof. Lei Shi

石磊 教授，西北工业大学

- 国家级青年人才

Biography

Dr. Lei Shi is a professor at the Institute of Aerospace Propulsion, Northwestern Polytechnical University. He obtained his PhD degree at Northwestern Polytechnical University in 2014. His research interests include airbreathing propulsion and combined cycle propulsion. He has published more than 60 academic papers in international journals. He is also an editorial board member of Journal of Propulsion Technology and Aerospace Technology. His research work has been supported by NSFC and et al.

Speech Title & Abstract

High-Temperature Jet-Assisted Scramjet Combustion: Numerical Investigation of Low Dynamic Pressure Operation

As a critical propulsion technology for near-space hypersonic vehicles, scramjet engines demonstrate unique advantages in specific impulse performance and structural simplicity through aerodynamic compression of incoming supersonic flow. However, their operational envelope is constrained by combustion instability under low dynamic pressure conditions encountered at high-altitude flights. This study presents a comparative numerical analysis of combustion characteristics between baseline scramjet and high-temperature jet-assisted configurations at Mach 6 and 7 flight conditions with dynamic pressures ranging from 20 to 90 kPa. Key findings reveal that reduced dynamic pressure significantly degrades combustion efficiency in conventional scramjet mode primarily due to insufficient residence time and depressed reaction kinetics. The implementation of high-temperature jet demonstrates substantial performance enhancement, achieving much higher combustion efficiency. Parametric studies further identify an optimal oxygen-fuel ratio window for the auxiliary jet that maximizes combustion stabilization while maintaining acceptable pressure loss. These results provide critical insights for developing adaptive combustion control strategies in hypersonic propulsion systems operating across extended altitude regimes.

■ INVITED SPEECH

Time:
13:00-13:30 | March 29, 2025

Venue: 3F, RuiYun Convention Room (A2), Building ①
园中楼瑞云厅



Dr. Zhaolin Chen

陈肇麟 博士，南京航空航天大学

- Nanjing University of Aeronautics and Astronautics, China

Biography

Dr. Zhaolin Chen obtained both his MEng (Aerospace Engineering) in 2009 and his Ph.D (Aerodynamics) in 2014 from the University of Sheffield, UK. He started his career working as a Post-Doctoral Research Associate at the University of Sheffield after his Pd.D under Professor Ning Qin. From 2015 to 2018, he served as a Senior Engineer in the Turbomachinery Design Department at FlaktGroup Ltd. in the United Kingdom. In 2019, He joined in the department of aircraft design of NanJing University of Aeronautics and Astronautics (NUAA). Research wise, his field of study focuses on the development of computational methods for solving governing fluid flow equations as well as optimization techniques. Specific research areas encompass steady and unsteady flow simulation solutions, mesh deformation techniques, optimization methodologies, and aerodynamic-structural coupling. Specific applications encompass aerodynamic and aeroacoustic simulation as well as optimization of wings and rotor blades. Recent efforts have concentrated on the design of aerial vehicles for Mars exploration. This includes the development of multi-fidelity codes for rotor design, aero-structural optimization of rotors, and performing experimental tests simulating the Martian environment.

Speech Title & Abstract

Experimental and Numerical Study on the Aerodynamic Performance of a Mars Counter-Rotor System

This study explores the aerodynamic behavior of Mars rotor systems (single/coaxial configurations) through experimental and computational methods. Validation tests on standard APC propellers showed less than 5% deviation between simulations and experiments. Detailed analysis of an ultra-thin blade rotor system revealed pitch-angle-dependent flow mechanisms.: At $\phi = 15.8^\circ$, a stable leading-edge separation bubble forms on the upper surface, which is penetrated and split by shock waves in the tip region ($r/R \approx 0.7-0.9$) with increasing rotation speed, creating shock-separation bubble interaction. For $\phi = 19.8^\circ$, mid-span shock-vortex interactions ($r/R = 0.5-0.75$) with different phase vortex shedding phenomena, demonstrating the intricate dynamics of compressible low-Reynolds flows. Systematic evaluation of pitch angles ($15.8^\circ-19.8^\circ$) elucidates critical performance trade-offs for Martian hovering rotors. Additionally, reduced rotor spacing ratio ($H/D = 0.09$) amplifies nonlinear aerodynamic interactions, lowering thrust-power ratios (upper rotor: 52.7% of a single rotor) due to altered effective angles of attack. Larger spacing ($H/D = 0.18$) mitigates interference, improving upper and lower rotor thrust-power ratio to 92.3% and 72%, respectively. Doubling spacing nearly doubles thrust (7.42 N achieved at 2103 RPM vs. 3124 RPM for $H/D = 0.09$), reducing blade interference and shortening leading-edge separation bubbles. This enhances system efficiency, elevating the Figure of Merit to 0.602 and narrowing the efficiency gap with single rotors from 32.6% to 7.1%. Optimal spacing balances thrust performance and rotational energy consumption.

■ INVITED SPEECH

Time: 13:30-14:00 | March 30, 2025

ZOOM ID: 849 3290 9499



Assoc. Prof. Xiaodong Cai

蔡晓东 副教授，国防科技大学

- National University of Defense Technology, China

Biography

Prof. Xiaodong Cai primarily focuses on fundamental and applied research in supersonic detonation combustion. He has received several prestigious awards, including the National Outstanding Ph.D. Thesis Award in Aeronautics and Astronautics, the National Postdoctoral Innovative Talents Support Program, the Hunan Provincial Outstanding Youth Foundation, and the first prize in Natural Science from the Chinese Society of Aeronautics and Astronautics. He has published over 30 SCI papers as the first or corresponding author and has authored two monographs.

Speech Title & Abstract

Detonation initiation in Nonuniform Supersonic Flows with Transverse fuel injection

This study investigates the mechanisms of flame acceleration and deflagration-to-detonation transition (DDT) in supersonic flows using transverse hydrogen injection and downstream ignition. Utilizing the graphics processing unit (GPU) accelerated adaptive mesh refinement approach, we examine the influence of ignition jet pressure on DDT through high-resolution computational simulations. Our results indicate that the transverse injection of hydrogen into the supersonic mainstream generates strong turbulence and numerous vortices due to Kelvin-Helmholtz instability, enhancing fuel mixing efficiency along the flow but deviating from the ideal premixed state. Following the injection of the ignition jet into the supersonic main flow, initial flame acceleration is less effective than in the premixed state due to the non-uniformity of the incoming flow. However, within the boundary layer, the flame remains stable, and the intense turbulence fosters shock-flame interactions. The convergence of multiple compression waves into a shock wave facilitates energy deposition, coupling with the flame to trigger local detonation via the reactive gradient mechanism. The detonation wave exhibits complex wavefront structures, including vertical and oblique fronts induced by boundary layer interactions. Ignition jet pressure significantly impacts the DDT process and detonation wave characteristics, reducing ignition time and affecting the detonation temperature, pressure, and propagation speed. This study provides valuable insights into the dynamics of flame acceleration and DDT in supersonic flows with nonuniform fuel distribution. The findings highlight the critical role of ignition jet pressure in optimizing ignition and detonation processes, offering essential information for the design and development of future supersonic detonation engines.

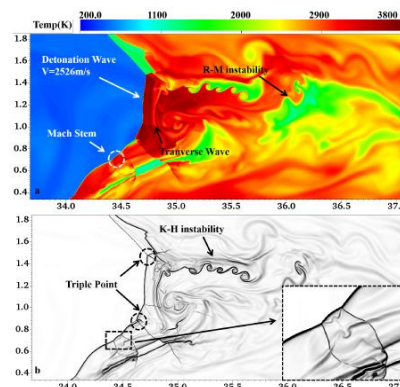


Fig.1 Detonation initiation after flame acceleration and DDT

■ Special Session 1A

“Aerospace Power and Propulsion”

航空航天动力与推进

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier and copy the presentation file to the computer.

Chairperson:

Prof. Lei Shi, Northwestern Polytechnical University, China
(Associate Researcher) Lin Sun, Northwestern Polytechnical University, China
Prof. Xiang Tang, Xi'an Modern Control Technology Research Institute, China

Time: 13:30-15:30, March 29, 2025

**Room: 2F YaoHua Convention Room (A1),
 Building ① | 园中楼瑶华厅**

13:30-13:45 AA25-202	<i>Conceptual Design of a Tandem TSTO Vehicle based on a Core-Burning RBCC Engine</i> Zhaoyang Tian , Xu Zhang, Bingqi Li, Xiaowei Liu and Lei Shi Northwestern Polytechnical University, China
13:45-14:00 AA25-268	<i>An equal-margin control method for inlet unstart protection in the solid rocket ramjet</i> Zhao Wang , Xiang Tang, Meng Huang, Xiaotao Tian, Bo Zhang Xi'an Modern Control Technology Research Institute, China
14:00-14:15 AA25-272	<i>Research on flow field of railway launch system of missile at different flight altitudes</i> Yichen Wang , Jinlan Gou, Guigao Le Nanjing University of Science and Technology, China
14:15-14:30 AA25-209	<i>Freejet Tests on a Variable Geometry Supersonic Inlet Driven by Shape Memory Alloys</i> Yuhui Wang , Junhua Zhang, Zhaoyang Tian, Lei Shi Northwestern Polytechnical University, China
14:30-14:45 AA25-273	<i>Research on the Bottom Thermal Environment of Mars Spacecraft in High Altitude Flight Environment</i> Zhongyi Sun , Chengeng Zhao, Luchuang Ma Malvern College Hong Kong, Hong Kong, China
14:45-15:00 AA25-296	<i>Effect of secondary combustion and flow Mach number on base thermal environment of re-entry rocket under retro-propulsion</i> ZHENG Hao , CHEN Xiangnan, TANG Yong, SHI Baolu Beijing Institute of Technology, China
15:00-15:15 AA25-276	<i>Investigating the thermal environment of a launch platform during takeoff of a launch vehicle</i> Shifan Wu , Bangming Li and Guigao Le Nanjing University of Science and Technology, China
15:15-15:30 AA25-267	<i>Research on Solid Rocket Motor Design Framework Based on Design Space Traversal and Full-time Simulation</i> Jia-ren Ren , Ran Wei, Xiao Hou, Fu-ting Bao Northwestern Polytechnical University, China

Session Group Photo

Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)

■ Session 2

“Dynamics Modeling and Fluid Mechanics Analysis in Aerospace Engineering”

航空航天工程中的动力学建模与流体力学分析

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier and copy the presentation file to the computer.

Chairperson:

Dr. Zhaolin Chen, Nanjing University of Aeronautics and Astronautics, China

Time: 13:30-15:30, March 29, 2025

**Room: 2F RuiYun Convention Room (A2),
Building ① | 园中楼瑞云厅**

13:30-13:45 AA25-222-A	<i>Non-uniform premixed flame acceleration and DDT with different chemical reaction mechanisms</i> Fei Xu , Jianhan Liang, Xiaodong Cai, Yuqiao Chen National University of Defense Technology, China
13:45-14:00 AA25-230-A	<i>Effects of multi-nozzles lateral jet on the aerodynamic characteristics of hypersonic vehicle</i> Tiantian Chen , Hulin Huang, Han Xu, Yulong Chen, Chunyan Wang Nanjing University of Aeronautics and Astronautics, China
14:00-14:15 AA25-264	<i>Numerical study of ignition energy influence on flame acceleration and detonation transition in supersonic flow</i> Dejiao Luo , Zhehao Wei, Siqi Zhang, Lili Zhang, Mingchao Huang, Wandong Zhao, Xiong Yang National University of Defense Technology, China
14:15-14:30 AA25-247	<i>Reliability Evaluation Method for Additively Manufactured Aero Engine Exhaust Frames with Defects</i> Jia Wang , Huan Li, Li-Zhang Zhang, Ling Yang, Ai-Fang Chao, Qi-Chen Ren, Cheng-Wei Fei Fudan University, China
14:30-14:45 AA25-2110	<i>Investigation of the effect of the attack angle on the RBCC engine performance</i> Zhiqiang Li , Jiaqi Wu and Dekun Yan Northwestern Polytechnical University, China
14:45-15:00 AA25-294	<i>Development of oblique detonation wave engine theory and experimental research progress</i> YE Zhengmao , YANG Yang, ZHENG Sihang, ZHAO Qianpeng and YAN Jin China Academy of Launch Vehicle Technology, China
15:00-15:15 AA25-281	<i>Fourier neural operator-based data-driven method for predicting structural dynamic response</i> Xuliang Luo , Laihao Yang, Changfeng Nan, Xuefeng Chen, Yu Sun Xi'an Jiaotong University, China
15:15-15:30 AA25-212	<i>Numerical study on the suppression and separation boundary layer of low-pressure turbine wavy suction surface</i> Qi Wang , Timothy H. Lee, Pan Liu, Bangwei Liu, Yutao Zhuang, Jiahuan Cui Zhejiang University, China

Session Group Photo

Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)

■ Session 3

“Aerospace Material Mechanical Properties Analysis and Modeling”

航空材料力学性能分析与建模

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier and copy the presentation file to the computer.

Chairperson:
Assoc. Prof. Yi Cui, Nagoya University, Japan

Time: 13:30-15:00, March 29, 2025

**Room: 2F FuCui Convention Room (A5),
Building ① | 园中楼浮翠厅**

13:30-13:45 AA25-275	<i>Modelling and Experimental Verification of Stiffness Characteristics of Elastic Rings</i> Shuguang Wang , Mingfu Liao Northwestern Polytechnical University, China
13:45-14:00 AA25-258-A	<i>Structural Topology Optimization of 2D and 3D Periodic Structures for Lightweight Engineering Design</i> Yi Cui Nagoya University, Japan
14:00-14:15 AA25-213	<i>Numerical investigation on cooling characteristics of an additively manufacturable composite cooling structure with swirling outflow</i> Yutao Zhuang , Honglin Li, Timothy H Lee, Bangwei Liu, Jiahuan Cui Zhejiang University, China
14:15-14:30 AA25-210-A	<i>The flow induced noise of the finite wall mounted circular cylinders</i> Wenyu Chen , Danielle Moreau, Con Doolan, Yingzheng Liu Shanghai Jiao Tong University, China
14:30-14:45 AA25-228-A	<i>Influence of voltage polarity on the performance of PSJ actuator at low-pressure</i> Chunyan Wang , Hulin Huang, Tiantian Chen, Xijing Hu Nanjing University of Aeronautics and Astronautics, China
14:45-15:00 AA25-E32	<i>Research on the Optimization Design of Low-Noise Valve Cores in Steam Turbine Control Valves Based on Parametric Modeling and Flow Field Analysis</i> Fujian Huang , Yuejin Dai, Zhangying Hou, Yue Wang, Bang Wang, Ziqi Wang, Xinyu Chu and Diangui Huang University of Shanghai for Science and Technology, China

Session Group Photo
Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)

■ Session 4

“Avionics System Design and UAV Collaborative Control”

航空电子系统设计及无人机协同控制

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier and copy the presentation file to the computer.

Chairperson:
Prof. Gang Sun, Fudan University, China

Time: 15:45-17:45, March 29, 2025

**Room: 2F YaoHua Convention Room (A1),
Building ① | 园中楼瑶华厅**

15:45-16:00 AA25-2106-A	<i>An Advanced Cold Plate Design for Enhanced Electronics Cooling</i> Yanyan Liu , Sjouke Schekman, Yongpu Wang, Tian Jian Lu, Tongbeum Kim Nanjing University of Aeronautics and Astronautics, China
16:00-16:15 AA25-207	<i>A Three-dimensional Path Planning Method of UAV Formation Based on Deep Q-Network</i> Chao Zhang, Boyuan Chen , Chunshi Fan, Linghui Yu, Zhiwen Wang Northwestern Polytechnical University, China
16:15-16:30 AA25-223-A	<i>Efficient parallelization of Large Eddy Simulation using graphics processing unit</i> Yuqiao Chen , Jianhan Liang, Lin Zhang, Hongwei Qiao, Fei Xu National University of Defense Technology, China
16:30-16:45 AA25-E26-A	<i>Stability and convergence of physics-informed neural network solution schemes for non-isothermal poromechanics: monolithic and splitting-based iterative approaches</i> Kaile Jia , Xiaoqiang Wang, Detang Lu University of Science and Technology of China, China
16:45-17:00 AA25-237	<i>Sine wave motion control of the helicopter rescue simulator based on CSP mode</i> Jitao Si , Wei Xiong, Hongwang Du and Zheng Li Dalian Maritime University, China
17:00-17:15 AA25-243	<i>Analysis of 3:1 internal resonance of a rigid-flexible coupling antenna system with three degrees of freedom</i> Hongkai Jiang , X Gao, Y Sheng, W Tang, P Shi Nanjing Tech University, China
17:15-17:30 AA25-218	<i>Research on cooperative strike task allocation method of multi-UAV cluster</i> Chao Zhang, Jianlu Guo , Fei Wang, Boyuan Chen, Chunshi Fan, Linhui Yi, Zhiwen Wang Northwestern Polytechnical University, China
17:30-17:45 AA25-E29-A	<i>Wind energy harnessing by piezo-cantilevers via fluidically amplified flapping</i> Yongpu Wang , Yanyan Liu, Michael David Atkins, Tian Jian Lu, Tongbeum Kim Nanjing University of Aeronautics and Astronautics, China

Session Group Photo
Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)

■ Session 5

“Aircraft Structural Design and Safety Analysis”

飞机结构设计及安全性分析

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier and copy the presentation file to the computer.

Chairperson:

Asst. Prof. Wandong Zhao, National University of Defense Technology, China

Time: 15:45-17:30, March 29, 2025

**Room: 2F RuiYun Convention Room (A2),
Building ① | 园中楼瑞云厅**

15:45-16:00 AA25-236	<i>Fatigue Strength Analysis of the Beam in the Helicopter Rescue Simulator Experiment Platform</i> Zheng Li , Hongwang Du, Yidong Chen, Zuwei Wang, Wei Xiong Dalian Maritime University, China
16:00-16:15 AA25-283	<i>Towards Autonomous Aerial Docking of Multirotor UAVs: Integrating Vision and RTK in Outdoor Scenarios</i> Xufei Dong , Fujian Cai, Haojie Liu, Rui Huang Nanjing University of Aeronautics and Astronautics, China
16:15-16:30 AA25-269	<i>Multi-objective optimization of aircraft wing beam cross-sections using reinforcement learning</i> Menglong Ding , Zhaoyang Xu, Jinting Xuan, Yanyan Zhang, Dawei Bie, Jiaxin Tan, Lintao Shao Tianmushan Laboratory, China
16:30-16:45 AA25-284	<i>High-fidelity and aero-structural design optimization of a martian propeller</i> Ndouba Ange Benai-dara , ZhaoLin Chen, Leon Kaswango Kanama, and Y Liu Nanjing University of Aeronautics and Astronautics, China
16:45-17:00 AA25-250	<i>Heat insulation and deformation resistance assessment of a novel variable-diameter lattice structure</i> Jian-Xiong Zheng , Chen Li, Ling Yang, Ai-Fang Chao, Qi-Chen Ren, Cheng-Wei Fei Fudan University, China
17:00-17:15 AA25-E30	<i>Numerical study the influence of wingtip docking patterns on the LSB Characteristics at low Reynolds number</i> Zhen Liu , Zhaolin Chen, Haojie Liu, Rui Huang Nanjing University of Aeronautics and Astronautics, China
17:15-17:30 AA25-219	<i>Experimental Study on Dynamic Design Method of Dual-Rotor System with Inter-Shaft Bearing</i> Chi Cheng , Mingfu Liao, Rui Wang, Junyao Kuang Northwestern Polytechnical University, China

Session Group Photo

Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)

■ Poster Session

“Power Equipment Design, System Modeling, and Reliability Analysis in Aerospace Engineering”

航空航天工程中的动力设备设计，系统模型及可靠性分析

*Note:

Please arrive at the room 10 minutes earlier to get the poster prepared for presentation. Tape is provided onsite. Please ask the staff to have it. Please stand by your poster when the participants go for your poster. Certificate will be delivered after your poster presentation and group photo is required. Please take it away after the session, otherwise conference team will dispose the posters.

Chairperson:
Assoc. Prof. Xuhui Li, Harbin Engineering University, China

Time: 16:00-17:00, March 29, 2025

**Room: 2F FuCui Convention Room (A5),
Building ① | 园中楼浮翠厅**

P01 AA25-266	<i>Effects of mainstream incidence angle on the turbine blade leading edge film cooling of cylindrical and laidback holes</i> Hongye Li , Qingzong Xu, Qiang Du, Guangyao Xu, Haoyang Liu, Jiawei Xu University of Chinese academy of science, China
P02 AA25-270	<i>Study on the influence of canard setting angle and longitudinal position on the sonic boom of supersonic business jet</i> Lintao Shao , Dawei Bie, Jinting Xuan, Menglong Ding Tianmushan Laboratory, China
P03 AA25-249-A	<i>Study on evaporation characteristics of single droplet rocket kerosene gel in a high pressure environment</i> Fujia Cai, Yujuan Zhu , Linyuchen Zhang, Zhewei Li, Minchao Huang, Wandong Zhao, Tie Li National University of Defense Technology, China
P04 AA25-2103	<i>A numerical study on the parachute inflation process at a high angle of attack using the arbitrary Lagrangian-Eulerian method</i> Jian Jiang , Chang Cai, Tengyuan Wang, Yan Wang Nanjing University of Aeronautics and Astronautics, China
P05 AA25-289	<i>Numerical Study of Surface Temperature of a Slender Body at Subsonic and Supersonic Flights</i> Zhenghong Li, Qing Cao , Xianyu Liu Shenyang Aircraft Design Institute, China
P06 AA25-2108	<i>Study on the Structural Characteristics of the Combined Material Leading Edge of an Aeroengine Based on a Coupling Algorithm</i> Chao Liu , Jingxian Liu, Chenggang Tang Wuhan University of Technology, China
P07 AA25-E28	<i>Research on Flow Force of Check valve for Space Station Based on the Theory of Flow around Motion</i> Fufu Wang , D Guo, L Zhang, Z H Qiao, Z Wang and L W Fan Chinese Academy of Sciences, China

P08 AA25-E31-A	<i>Configuration Evolution of Bistable Plates in Centrifugal Environments</i> Pengpeng Liu , Yinghui Li Southwest Jiaotong university, China
P09 AA25-2100	<i>Numerical simulation of powder fuel blending characteristics in a supersonic partially covered cavity-based combustor</i> Wenxue Han , Chunbo Hu, Chao Li, Rong Lei, Wei Cui, Jiaxin Dong Northwestern Polytechnical University, China
P10 AA25-2104	<i>Flight Path Programming for Vertical Take-off and Landing aircraft with the Vectoring Thrust Engine</i> Jiaojiao Cheng , Guoping Huang, Bo Jin Nanjing University of Aeronautics and Astronautics, China
P11 AA25-292	<i>Research on Simulation Method for Optimal Design of Complex Systems</i> Zhenghong Li, Yunhan Fu , Xianyue Liu Shenyang Aircraft Design Institute, China
P12 AA25-2109	<i>Numerical Study on a Medium-pressure Centrifugal Fan Near Stall Condition with Different Computational Fluid Dynamics Methods</i> Liren Wang , Wei Lyu, Yan Wang Nanjing University of Aeronautics and Astronautics, China
P13 AA25-224-A	<i>The moisture effect on the degradation of carbon fiber/ epoxy interface modified by silane coupling agents: Insights from molecular dynamic simulations</i> Wangdong Guan , Hui Cheng, Haoyuan Suo, Zhaohui Wei, Yiheng Wei, Bin Luo Northwestern Polytechnical University, China
P14 AA25-E25-A	<i>Fatigue response and wear behavior of CFRP/Ti laminated single-lap bolted joint under fretting load</i> Zhaohui Wei , Kaifu Zhang, Wangdong Guan, Bin Luo, Haoyuan Suo Northwestern Polytechnical University, China
P15 AA25-216-A	<i>Investigation on static and fatigue performance of CFRP/aluminum alloy interference bolted joints considering the influence of hole-axis error</i> Caoyang Wang , Hui Cheng, Yi Cheng, Kaifu Zhang Northwestern Polytechnical University, China
P16 AA25-221-A	<i>Physics and data-driven method for concurrent multiscale analysis of damage in CFRP interference-fit joints</i> Wenlong Hu , Hui Cheng, Kaifu Zhang, Biao Liang Northwestern Polytechnical University, China
Session Group Photo Best Presentation Award will be announced on Dinner Banquet (18:00, March 29)	

■ Special Session 1B

“Aerospace Power and Propulsion”

航空航天动力与推进

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.

Chairperson:
Prof. Lei Shi, Northwestern Polytechnical University, China
(Associate Researcher) Lin Sun, Northwestern Polytechnical University, China
Prof. Xiang Tang, Xi'an Modern Control Technology Research Institute, China

Time: 09:00-10:15, March 30, 2025

ZOOM ID: 849 3290 9499

09:00-09:15 AA25-277	<i>Morphological evolution of molten boron aggregates during secondary combustion</i> Delei Shi , Qiang Cai, Lin Sun and Futing Bao Northwestern Polytechnical University, China
09:15-09:30 AA25-290	<i>Architecture Design of Distributed Solid Rocket Motor Integrated System</i> Xin-ping Fan , Ran Wei, Xiao Hou, Si-yuan Gou, Yi-fan Ma Northwestern Polytechnical University, China
09:30-09:45 AA25-291	<i>Multi-Scale CNN-LSTM-Attention for Reverse Design of Solid Rocket Propellant Grains</i> Xiangyu Peng , Kaixuan Wang, Lin Sun, Yang Liu, Ran Wei, Weihua Hui Northwestern Polytechnical University, China
09:45-10:00 AA25-293	<i>Research on Transient characteristics of the Pintle Injector</i> Haifeng Hu , Wei Zhu, Xiao Zhang National Key Laboratory of Aerospace Liquid Propulsion, China
10:00-10:15 AA25-298	<i>Study of prediction models for axial and lateral thrust in supersonic split line nozzles</i> Shiji Yu , Lin Sun, Delei Shi, Futing Bao Northwestern Polytechnical University, China
10:15-10:30 AA25-2102	<i>Numerical investigation on establishment process of opposing jet in supersonic flows</i> Liang Zhu , Xiang Tang, Jun Song, Hao-bi Bai Xi'an Modern Control Technology Research Institute, China

Best Presentation Award & Session Group Photo

■ Session 6

“Aviation Electronics Systems and Aviation Communication Technology”

航空电子系统与航空通信技术

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.

Chairperson:
Assoc. Prof. Yat-Sze Choy, The Hong Kong Polytechnic University, Hong Kong, China

Time: 10:30-12:15, March 30, 2025

ZOOM ID: 849 3290 9499

10:30-10:45 AA25-265	<i>Intelligent Path Programming Approach for Autonomous Ecological Vehicles Based on Fuzzy Logic Control</i> Biyogo Nchama Vicente Angel Obama , Hossen MD Akram, YE Yukun, HAN Haoyu, ZHAO shuang, SHI peng Beihang University, China
10:45-11:00 AA25-229	<i>Research On On-orbit Temperature Analysis and Thermal Design Optimization of Geosynchronous Orbit Cryogenic Infrared Camera</i> Nana Xu , Feng Yu, Yang Wang, Chang Liu Beijing Institute of Space Mechanics and Electricity, China
11:00-11:15 AA25-235	<i>Research on Two-dimensional Torsion Resistance Characteristics of GEO Telecommunication Satellite Extravehicular Motion Cable</i> Siqiao Ge , Beifei Sheng, Yu Fu, Fengping He, Dongyang Luo, Xuyang Du China Academy of Space Technology, China
11:15-11:30 AA25-246	<i>Modelling of disturbance mechanisms in the unfolding process of loitering munitions and the design of flight controller</i> Hanwei Lin , Huilong Zheng, Qian Zhang, Hang Yang, Hong Zhou Institute of Engineering Thermo-physics, China
11:30-11:45 AA25-286	<i>Numerical investigation of the noise characteristics and localization of aeronautical pitot tubes during cruise conditions of large civil aircraft</i> Runpei Jiang , Peiqing Liu, Jin Zhang Beihang University, China
11:45-12:00 AA25-2101	<i>A Midcourse multi-missile cooperative coverage interception and multi-target assignment method based on the TS-HASO algorithm</i> Ziqing Hua , Mingying Wei, Yunqian Li, Zhengda Cui Beijing Institute of Electronic System Engineering, China
12:00-12:15 AA25-260	<i>Research on airspace route traffic flow prediction algorithm based on improved spatio-temporal feature fusion</i> Man Zhang , Zhi Wang Northwest Air Traffic Control Bureau of CAAC, China

Best Presentation Award & Session Group Photo

■ Session 7

“Complex System Design and Functional Simulation Analysis”

复杂系统设计与功能仿真分析

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.

Chairperson:

Assoc. Prof. Xiaodong Cai, National University of Defense Technology, China

Time: 14:00-15:45, March 30, 2025

ZOOM ID: 849 3290 9499

14:00-14:15 AA25-254	<i>Selection of a rational scheme of axial compressor blades parameterization for three-dimensional optimization of the working process</i> E S Goriachkin , O V Baturin, A I Scherban and E D Gataullina Samara National Research University, Russia
14:15-14:30 AA25-224	<i>Parametric Analysis of TNT Charge Height Effects on Slab Response to Touch-Off Explosions</i> S. M. Anas, Rayeh Nasr Al-Dala'ien , Mehtab Alam Al-Balqa Applied University (BAU), Jordan
14:30-14:45 AA25-255	<i>Design of the inlet unit for core engine test stand of gas turbine engine</i> S A Melnikov , V M Zubanov, E S Goryachkin and Nguyen Thanh Binh Samara National Research University, Russia
14:45-15:00 AA25-245	<i>Numerical Simulation Study of Porous Media Heat Exchangers Based on the Porous Media Substitution Model</i> Jun Zhang , Zhaoda Zhang, Yu Liu*, Mingrui Sun, Kangjie Liu and Guanghan Yan DaLian university of technology, China
15:00-15:15 AA25-256	<i>Development of a methodology for initial multidisciplinary design of axial turbines of gas turbine engines using digital technologies</i> G M Popov , O V Baturin, E D Gataullina and I M Ilyin Samara National Research University, Russia
15:15-15:30 AA25-280	<i>Study on ventilation and compression performance of honeycomb-based double-wall panels for auxiliary fuel tank</i> Jun Chen , Dongguang Xu, Wenjia Wu Shanghai Aircraft Design and Research Institute, China
15:30-15:45 AA25-257	<i>Prediction of the two stage turbine cavities thermal state with calculating unsteady processes of hot gas inflow</i> G Popov , V Zubanov, S Melnikov and A Scherban Samara National Research University, Russia

Best Presentation Award & Session Group Photo

■ Session 8

“Fault Detection and Dynamic Analysis of Aviation Power Machinery Equipment”

航空动力机械设备故障检测与动力学分析

*Note:

The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.

Chairperson:
Prof. Long Chen, Northwestern Polytechnical University, China

Time: 16:00-18:00, March 30, 2025

ZOOM ID: 849 3290 9499

16:00-16:15 AA25-217	<i>Flow Heat Transfer and Thermal Stress Characterization of Elliptical Kelvin Structures Based on CT Reconstruction</i> Kangjie Liu , Zhaoda Zhang, Yu Liu, Mingrui Sun, Jun Zhang and Guanghan Yan Dalian University of Technology, China
16:15-16:30 AA25-201	<i>Corrosion Inhibition in Electrochemical Grinding of Honeycomb Seal Using Sodium Lignosulfonate</i> Jinhao Wang , Lu Wang, Hansong Li, Ningsong Qu Nanjing University of Aeronautics and Astronautics, China
16:30-16:45 AA25-208	<i>Design and Performance Analysis of a Finned Tube Heat Exchanger</i> Jin Pan , Feng Jin Jiangsu Maritime Institute, China
16:45-17:00 AA25-220	<i>Analysis of Flow Pulsation Characteristics of Engine Fuel Supply System with External Gear Pump</i> Lang Wang, Fang Wan, Yueru Wang, Yong Sang Dalian University of Technology, China
17:00-17:15 AA25-232	<i>An Automatic Inspection Method for Space Launch Sites</i> Jing Lan , Bingjie Wu, and Qiang Ma Jiuquan Satellite Launch Center, China
17:15-17:30 AA25-274	<i>Particular Risk Analysis Method of Uncontained Engine Rotor Burst for Civil Aircraft APU System</i> Yusang Li , Wencao Tao, Dong Wang COMAC Shanghai Aircraft Design and Research Institute, China
17:30-17:45 AA25-278	<i>Research and Analysis of Flight Load Measurement for Multiple Connecting Rods Configuration Wing</i> Yuwen Zhu , Tenglong Gao, Ning Tang, Xian Jiang, Dan Liu Chinese Flight Test Establishment, Xian, Shaanxi, China
17:45-18:00 AA25-253	<i>Analysis of the Droplet Collection Efficiency of the Ringsail Parachute</i> Donghao Li , Juan Fang, Ruirui Liu, Tingting Geng Jiuquan Satellite Launch Center, China

Best Presentation Award & Session Group Photo

■ Delegate

- **Fujian Cai, Nanjing University of Aeronautics and Astronautics, China**
- **Wandong Zhao, National University of Defense Technology, China**
- **Chao Li, Northwestern Polytechnical University, China**
- **Wei Lyu, Hengchi Environmental Equipment (NANJING) CO., LTD, China**
- **Shiqiang Zhuang, Jinan University, China**

[illegible]

[illegible]