



CONFERENCE PROGRAM

**The 2nd Asian Aerospace and Astronautics Conference
(AAAC 2024)**

第二届亚洲航空航天会议



Live Photo (会议照片直播)

Nanjing, China | September 27-29, 2024

中国·南京 | 2024年9月27-29日



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WELCOME ADDRESS

Dear Attendees,

The 2nd Asian Aerospace and Astronautics Conference (AAAC 2024) will take place in Nanjing, China from September 27-29, 2024, where participants will gain detailed insights into the state of the art of aerospace and astronautics, and enjoy the exchange with other enthusiasts from all over the world who are interested in this highly relevant and constantly growing area.

AAAC 2024 is co-sponsored by Nanjing University of Science and Technology (NJUST), China, Nanyang Technological University (NTU), Singapore and IEEE, hosted by School of Mechanical Engineering (NJUST-SME) and School of Electrical and Electronic Engineering (NTU-EEE), Supported by Key Laboratory of Special Engine Technology, Ministry of Education, Kuiyuan laboratory of NJUST, International Society of Mechanical System Dynamics (ISMSD), Department of Aeronautical and Aviation Engineering (AAE) of The Hong Kong Polytechnic University (PolyU), York University, Bauman Moscow State Technical University (BMSTU) and etc.

After several rounds of rigorous review, the program committee not only indicated acceptance but also provided ratings on those papers accepted for publication in the AAAC conference proceedings. We wish to express our sincere appreciation to all individuals who have contributed to AAAC 2024 conference in various ways. Special thanks are extended to our colleagues in the program committee for their review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and other volunteers who had dedicated their time and efforts in planning, promoting and organizing the conference.

We have eleven keynote and invited speakers to give us report on their related research. They are Erick Landsard, from Nanyang Technological University, Singapore; Wenhe Liao, from Nanjing University of Science and Technology, China; Zhenghong Zhu, from York University, Canada; Lim Wee Seng, from Nanyang Technological University, Singapore; Wenhua Chen, from Loughborough University, UK; Jinjun Shan, from York University, Canada; Peijin Liu, from Northwestern Polytechnical University, China; Olga Starinova, from Samara University, Russia; Ivan Tkachenko, from Samara University, Russia; Lei Lei, from Nanjing University of Aeronautics and Astronautics, China; Weitao Wu, from Nanjing University of Science and Technology, China. And there are eight sessions in this conference. One best presentation will be selected from each session, which will be evaluated based on originality, applicability, technical merit, quality of PPT and communication skill. The best one will be announced at the end of each session.

We believe that these works will lay the foundation for further research and the interactions during the conference will lead to much improved version of the extended papers.

Have a nice communication on the conference!

AAAC 2024 Organizing Committees
For and on behalf of
September, 2024



CONFERENCE COMMITTEES

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Wenhe Liao, Nanjing University of Science and Technology, China

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China, China
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Nishanth Pushparaj, University of Nottingham, UK
Chengxiang Zhu, Xiamen University, China
Zhou Ye, Universiti Sains Malaysia, Malaysia
Larry Li, The Hong Kong University of Science and Technology, Hong Kong, China
Yanfang Liu, Harbin Institute of Technology, China



VENUE INFORMATION

❖ Conference Venue



南京维景国际大酒店
Grand Metropark Hotel Nanjing

地址：南京市玄武区中山东路 319 号
Address: 19 Zhongshan East Road, near Ming Palace Road, Xuanwu District, Nanjing, China

住宿 Accommodation	预订热线：+86 13512512233（李经理） Reservation Tel: +86 13512512233, Ms. Li	报 AAAC 2024 享会议协议价 Enjoy AAAC 2024 Agreement Price
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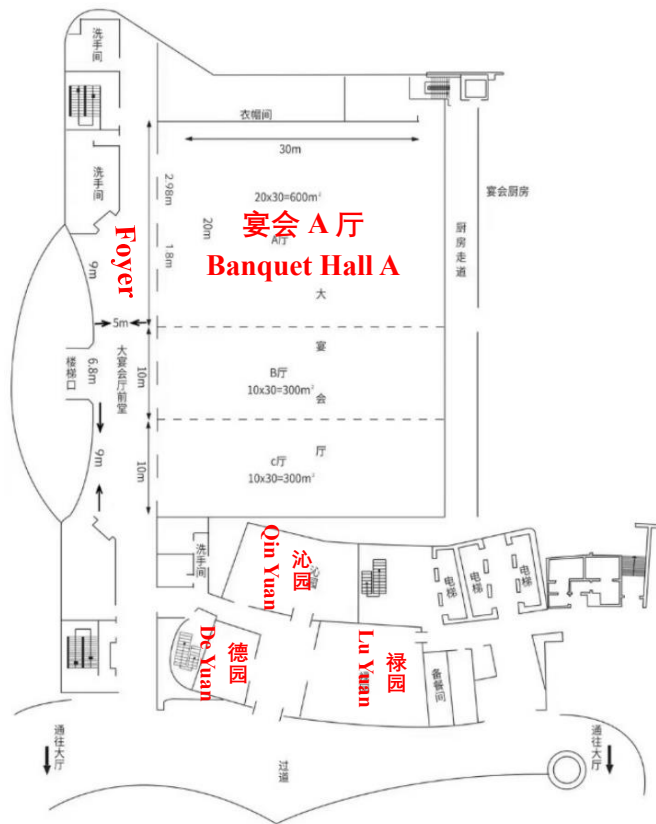
❖ Time Zone

Beijing Time: UTC +8



❖ Conference Room Map

二楼平面图



Time	2F·Banquet Hall A (二楼宴会 A 厅)	2F·Lu Yuan (二楼禄园厅)	2F·Qin Yuan (二楼沁园厅)	2F·De Yuan (二楼德园厅)	2F·Foyer (2 楼走廊)
Sept. 28	Speeches Dinner Banquet	-----	-----	-----	-----
Sept. 29	-----	Session 1 Session 4	Session 2 Session 5	Session 3	Poster



GUIDELINE FOR ATTENDANCE

For Everyone

- ◆ The whole conference program is scheduled in Beijing Time (UTC+8).
- ◆ Please double check your Test Time and Presentation Time, and adjust times to device's time zone.
- ◆ English will be the only language used for presentation.
- ◆ **September 27:** Online Test, Onsite Sign in; **September 28:** Opening Ceremony, Conference Speeches; **September 29:** Oral Sessions.
- ◆ Each Keynote Speech is within 30 Mins; Each Invited Speech is within 20 Mins.
- ◆ Each oral presentation is allocated with 15 Mins (13 Mins presentation, 2 Mins for Q&A), please prepare your English slides in advance.

For Onsite Presenters

❖ Oral Presentation

- ◆ Your punctual arrival and active involvement in each session will be highly appreciated.
- ◆ Get your presentation PPT slides, or PDF files prepared in advance and backed up.
- ◆ Laptop, projector & screen, laser sticks will be provided in the meeting room for presentation use.

❖ Poster Presentation

- ◆ Poster size: 0.6m width X 0.8m height
- ◆ **Poster to be printed and brought to conference site by presenter self.**
- ◆ At least 1 author to stand by the poster during the poster session, which is not only to present your work, but also to answer questions from the audience.

❖ More Tips

- ◆ Please take all your belongings when leaving meeting room.
- ◆ Conference organizers do not provide accommodation, please reserve your hotel room in advance.

For Online Presenters

❖ Tool

- ◆ **ZOOM (zoom.com.cn or zoom.us)** will be used for the whole online event. On the bottom of the web page, you can choose download the app for free and then choose 'JOIN A MEETING', then input room's ID. As usual you could not create an account now, so you can join in our conference as a visitor, ZOOM may ask you to input your phone number and the passwords they sent to your number to verify.

❖ How to Use Zoom

- ◆ Download the ZOOM on <https://www.zoom.us/download>.
- ◆ Turn on your Audio and start your Video. Use headsets/Earphones to enhance the audio effect and avoid the speaker echo or howling. Stay in a quiet place without noise.
- ◆ Join TEST DAY, we will help the delegates know better how to use ZOOM functions as following:
 1. RENAME: authors please rename like Session Number+ Paper ID+ Name as you join the room. E.g.: S1+ME001+Lily. For KN/IS/SC, please rename like KN/IS/SC+ Name
 2. SHARE SCREEN: Choose the files you need to share
 3. RAISE HAND FUNCTIONS: If you have any questions, you can use this function
 4. CHAT: type the word on the chat board, you can chat to everyone in the room or someone privately



❖ **Presentation Tips**

- ◆ Please prepare a digital device with Microphone (mandatory) and Webcam (optional), a computer or laptop is recommended; and make sure you are connected to a stable and high-quality Wi-Fi network, or 4G/5G or internet if available.
- ◆ Read the detailed program, check the time and Zoom information of the session that you will do your presentation.
- ◆ One best presentation will be chosen from each presentation session and announced at the end of the session. The conference secretary will email you the certificates after the conference.
- ◆ Please enter in your session's room 10 Mins earlier of the start of session.
- ◆ When giving your presentation, please turn on the video.
- ◆ After your presentation, please leave the session room. At the end of the session, a group photo will be taken.

❖ **Zoom Information**

Zoom ID	889 0912 6918	Zoom Link	https://us02web.zoom.us/j/88909126918
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CONFERENCE AGENDA

Day 1 | September 27, 2024, Friday

Time	Activity	Venue
10:00-12:00	Online Test 线上测试	ZOOM ID: 889 0912 6918
10:00-17:00	Sign in & Conference Kit Collection 线下签到	Hotel Lobby 酒店大堂

Day 2 | September 28, 2024, Saturday

Time	➤ Venue: 2F · Banquet Hall A (二楼宴会 A 厅)
Host: Danhe Chen, Nanjing University of Science and Technology, China	
Opening Ceremony	
8:40-9:00	Opening Remarks
	Wenhe Liao Nanjing University of Science and Technology, China
	Program Address
	Xiong Chen Nanjing University of Science and Technology, China
Conference Speeches	
9:00-9:30	Keynote Speech 1:
	Erick Landsard Nanyang Technological University, Singapore Speech Title: <i>“Equatorial Sentinels for Environment”: An Innovative Small/Very Small Satellite Constellation to cope with Environmental Threats over Equatorial & Tropical Regions</i>
9:30-10:00	Keynote Speech 2:
	Wenhe Liao Nanjing University of Science and Technology, China Speech Title: <i>Ultra-Lightweight Design and Manufacturing of Aerospace Multi-functional Structures</i>



10:00-10:30	Group Photo & Morning Break
10:30-11:00	Keynote Speech 3: Zhenghong Zhu York University, Canada Speech Title: <i>Swarm Spacecraft and Swarm Intelligence: Pioneering Strategies for Space Debris Removal</i>
11:00-11:30	Keynote Speech 4: Lim Wee Seng Nanyang Technological University, Singapore Speech Title: <i>NTU Space@Singapore - VLEO Satellite</i>
11:30-12:00	Keynote Speech 5: Jinjun Shan York University, Canada Speech Title: <i>Intelligent Autonomous Systems: Dynamics and Control</i>
12:00-14:00	Lunch F1 • Cafe (一楼咖啡厅)
14:00-14:30	Keynote Speech 6: Wenhua Chen Loughborough University, UK Speech Title: <i>Autonomous Forced Landing of Unmanned Aircraft Systems</i>
14:30-15:00	Keynote Speech 7: Peijin Liu Northwestern Polytechnical University, China Speech Title: <i>Nonlinear Combustion Instability in Solid Rocket Motors</i>
15:00-15:30	Keynote Speech 8: Olga Starinova Samara University, Russia Speech Title: <i>Nominal Control of Spacecraft with Low Thrusters in the Asteroid Vicinity</i>
15:30-16:00	Coffee Break
16:00-16:20	Invited Speech 1: Ivan Tkachenko Samara University, Russia Speech Title: <i>Methodological Approaches to the Creation and Functioning of Serial Robotic Production of Small Spacecrafts</i>
16:20-16:40	Invited Speech 2: Lei Lei Nanjing University of Aeronautics and Astronautics, China



	Speech Title: <i>Research on Intelligent Cooperation Theory of Unmanned Aerial Vehicular Swarms Based on Digital Twins</i>
16:40-17:00	Invited Speech 3: Weitao Wu Nanjing University of Science and Technology, China Speech Title: <i>Physics Informed Machine Learning in Fluid Flow and Heat Transfer</i>
18: 00-20:00	Banquet 2F • Banquet Hall A (二楼宴会 A 厅)

Day 3 | September 29, 2024, Sunday

Time	Activity (Onsite Only)	Venue
9:00-10:45	Session 1: Aerospace Materials and Mechanical Properties Analysis	2F · Lu Yuan (二楼禄园厅)
	Session 2: Aircraft Control and Aerodynamic Analysis	2F · Qin Yuan (二楼沁园厅)
	Session 3: New Propulsion Technology Based on Combustion Mode	2F · De Yuan (二楼德园厅)
10:45-11:00	Coffee Break	
11:00-12:45	Session 4: Aviation Communication System and Control Technology	2F · Lu Yuan (二楼禄园厅)
	Session 5: Aeroengine Model and Control	2F · Qin Yuan (二楼沁园厅)
	Poster Session: Power Equipment Design, System Modeling, and Reliability Analysis in Aerospace Engineering	2F · Foyer (二楼走廊)
12:00-14:00	Lunch F1 • Cafe (一楼咖啡厅)	
14:00-17:00	NJUST Campus Visit	

Time	Activity (Online Only)	Online Room
8:45-10:45	Session 6: Aircraft Model and System Control	ZOOM ID: 889 0912 6918
10:45-11:00	Break	
11:00-13:00	Session 7: Aerospace Engine Design and Power System Parameter Analysis	ZOOM ID: 889 0912 6918



KEYNOTE SPEAKER

Local Time 9:00-9:30 | 2024.09.28 **Onsite Room** 2F · Banquet Hall A (二楼宴会A厅)**Erick Landsard**

Nanyang Technological University, Singapore

Speech Title: *“Equatorial Sentinels for Environment”: An Innovative Small/Very Small Satellite Constellation to cope with Environmental Threats over Equatorial & Tropical Regions***Bio**

Erick LANSARD holds an Engineering Master degree in Aerospace (1983), a Master of Science in Fluid Mechanics (1983) and a PhD in Space Geodesy (1987). In 1987 he joined Alcatel Espace to start mission analysis activities and to manage several advanced studies in the field of radar observation, signal intelligence, telecommunication and navigation (GNSS2). In 1999 he was appointed Director of System Engineering of Alcatel Space Industries then Director of Architecture, Observation & Sciences Space Systems in 2000 (Optical; Infra-red; Hyperspectral; Radar). He has been successively Director of Research of Alcatel Space, then of Alcatel Alenia Space in 2005 and of Thales Alenia Space in 2007, with R&T teams in Toulouse, Cannes, Roma and Torino. In 2010, he was appointed VP R&T France and Director of Thales Research & Technology-France, the Thales Corporate Research Lab in Palaiseau. In October 2013, he was appointed VP Technical & Space Development at Thales Solutions Asia, based in Singapore (also in charge of Innovation). From 2017 to February 2022 he has been VP Innovation and R&T of Thales Defense Mission Systems (also in charge of open innovation collaborations worldwide). From March 2022 onwards, he is Full Professor at Nanyang Technological University with the mission to develop NTU Space Activities. Among other duties, Erick is distinguished life member of the Air & Space Academy and of the International Academy of Astronautics. Erick is also AIAA Fellow, Alcatel-Lucent/Nokia Bell Labs Fellow and AAAF Emeritus. He has also chaired the International Astrodynamics Committee of the International Astronautical Federation. He has been an active member of distinguished Boards & Committees (eg: Scientific Council of French CNRS; Executive Board of Toulouse University; Scientific Board of Midi-Pyrénées Observatory; Singapore Supercomputing National Board). Erick has published over 50 papers and holds several patents in the field of space system engineering (and in particular of satellite constellation design).

Abstract

There is an urgent need to better understand the environmental phenomena that are threatening the populations that live in equatorial & tropical regions: Typhoons, floods, earthquakes, tsunamis, volcanoes, wildfires, pollutions etc. due to climate change and geo-hazards are causing huge damages to the societies and huge financial losses to the economies. Forecast models are existing but with limited accuracy and available data have a poor sampling above equatorial regions, especially for fast-varying phenomena. To improve this situation, new data are mandatory to fill the current knowledge gap.

Missing data could be provided by a constellation of environmental satellites in near-equatorial orbit - so-called Equatorial Sentinels - that would fully exploit the exceptional revisit time offered by this orbit (10 times better than polar orbit!). This would help to better understand extreme events and to mitigate their impact.

On-board Equatorial Sentinels, all kind of space sensors and technologies might be considered, with emphasis on innovative small satellites and nanosatellite pathfinders: Cheaper and faster to develop, they disruptive potential can be assessed and optimized in terms of cost/benefit/risk.

“Equatorial Sentinels” should not replace but complement the fleet of global environmental satellites owned by big space countries (e.g.: NASA, ESA, JAXA etc), with focus on filling the data gap above equatorial regions.



"Equatorial Sentinels" would not only benefit the equatorial regions but also benefit the rest of the planet, by feeding regional and global models with unique high revisit time measurements.

"Equatorial Sentinels" will also bring many business opportunities for the public and private stakeholders that will have invested in this concept. These new and quite unique equatorial data, with unprecedented revisit time, will trigger the sustainable development of new services and new applications for the benefit of governments and citizens.



KEYNOTE SPEAKER

Local Time

9:30-10:00 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Wenhe Liao

Nanjing University of Science and Technology, China

Speech Title: *Ultra-Lightweight Design and Manufacturing of Aerospace Multi-functional Structures*

Bio

Liao, Wenhe is a professor of Mechanical Engineering at Nanjing University of Science and Technology. He is also the vice president of NJUST and the director of National Local United Engineering Laboratory for Digital Forming Technology and Equipment. He is a member of the Expert Committee of the Additive Manufacturing Alliance of China, a standing director of Chinese Society of Astronautics, a standing director of Chinese Society of Aeronautics and Astronautics. He has led the team to develop intelligent additive manufacturing technology integrating structural lightweight design, process optimization, online monitoring, manufacturing of 3D structural circuits. He has devoted to the construction of an intelligent AM system and its industrial application. To date, under his supervision, some hardware and software systems for AM have been developed together with the process parameter library, high efficiency AM process software, lightweight design software and molten pool monitoring system.

Abstract

The multi-functional aerospace structure has the characteristics of lightweight, intelligent and biochemical imitation, and is a kind of structure with "innovative configuration and advanced performance". It integrates the advantages of mechanical design, advanced materials and advanced manufacturing, breaking through the shackles of design thought of single structure configuration, material and function. Design and manufacturing of ultra-lightweight multi-functional aerospace structures have always been the eternal goal for high-end equipment structures.

The present talk addresses the new advances in the design and additive manufacturing of ultra-lightweight multi-functional aerospace structures conducted in the Research Center for Additive Manufacturing of Difficult-to-Form Materials at NJUST. The focus is on the design of mechanical multi-functional lattice structures, design of multi-functional lattice structure with load bearing and wave-absorbing, additive manufacturing of multi-functional lattice structure, integrated manufacturing of 3D structural circuits.



KEYNOTE SPEAKER

Local Time

10:30-11:00 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Zhenghong Zhu

York University, Canada

Speech Title: *Swarm Spacecraft and Swarm Intelligence: Pioneering Strategies for Space Debris Removal*

Bio

Dr. Zheng H. (George) Zhu received B.Eng. (1983), M.Eng. (1986), and Ph.D. (1989) degrees in Engineering Mechanics from Shanghai Jiao Tong University in China. He also received his M.A.Sc. degree (1998) in Robot Control from the University of Waterloo and Ph.D. degree (2004) in Mechanical Engineering from the University of Toronto in Canada. He is currently a Professor and Tier I York Research Chair in Space Technology with the Department of Mechanical Engineering at York University in Toronto, Canada. Before joining York University in 2006, he worked as a senior stress/structural engineer in Curtiss-Wright Indal Technologies in Mississauga, Canada. From 2019-2022, he served as the inaugural Academic Director of Research Commons at the Vice-President Research and Innovation Office. His research interests include dynamics and control of tethered space systems, spacecraft attitude dynamics, computational control, space robotics control, machine learning, and space debris removal. He has authored and co-authored more than 340 articles. Dr. Zhu is the Principal Investigator of two CubeSat missions for deorbiting space debris for sustainable use of space and measuring the environmental impact of permafrost thawing in Northern Canada. Dr. Zhu is an elected Member of the International Academy of Astronautics, College Member of the Royal Society of Canada, Fellow of the Canadian Academy of Engineering, Fellow of the Engineering Institute of Canada, Fellow of the Canadian Society for Mechanical Engineering, Fellow of the American Society of Mechanical Engineers, Academician of International Academy of Astronautics, Associate Fellow of American Institute of Aeronautics and Astronautics. He is the recipient of the 2021 York President's Research Excellence award, the 2021 Robert W. Angus Medal by the Canadian Society for Mechanical Engineering, the 2019 PEO Engineering Medal in R&D by Professional Engineer Ontario, the 2013 & 2018 NSERC Discovery Accelerator Supplement awards, and ranked in the Top 2% Most cited Scientists of All Knowledge Fields Combined since 2020 by a Stanford University list.

Abstract

Current methods for addressing the escalating challenge of space debris depend on highly sophisticated, centralized autonomous robotic systems designed to capture and deorbit unknown and uncooperative debris. In contrast, the swarm spacecraft presents a transformative alternative by using a collective of small, simple spacecraft (e.g., CubeSats, Nanosats) to achieve robust, adaptable, and cost-efficient debris removal. Utilizing a behavior-based control strategy, this spacecraft swarm leverages swarm intelligence to enable a fully decentralized approach for capturing tumbling debris in orbit. This approach is inspired by natural swarm behaviors observed in ant colonies and bird flocks, integrating flocking behavior for coordinated maneuvering around debris surfaces and anti-flocking behavior to optimize CubeSat distribution, ensuring thorough surface coverage and effective encapsulation of debris shape before initiating capture. Each CubeSat is equipped with memory and local communication capabilities, facilitating macroscopic synchronization of the capture process through decentralized observations of key landmarks on the debris and local interactions with neighboring units. The swarm spacecraft operates as a fully decentralized, leaderless, self-organizing multi-agent network, with all CubeSats functioning interchangeably. This pioneering approach not only addresses the pressing issue of space debris but also establishes a new paradigm for autonomous space operations, demonstrating the significant potential of swarm intelligence to overcome complex, large-scale challenges.



KEYNOTE SPEAKER

Local Time

11:00-11:30 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Lim Wee Seng

Nanyang Technological University, Singapore

Speech Title: *NTU Space@Singapore - VLEO Satellite*

Bio

LIM, Wee Seng is the Executive Director of Satellite Research Centre, School of EEE in Nanyang Technological University (Singapore). He oversees the centre space program and is managing the university's VELOX-series of nanosatellites. Prior to joining the university, he is a Senior Manager in Renesas, responsible for the microcontroller business unit, product marketing and R&D for embedded systems. He graduated from Nanyang Technological University with a bachelor degree (Hon) in Electrical and Electronic Engineering in 1996.

Abstract

Nanyang Technological University's (NTU) Satellite Research Center (SaRC) is the birthplace of Singapore's designed satellites. The first satellite, XSAT, was launched in 2011. Since then, 13 nano- and micro-satellites have been designed, launched, and operated by the center. In 2013, the Singapore Office for Space Technology & Industry (OSTIn) was established, accelerating the nation's space activities. A key current initiative is the Very Low Earth Orbit (VLEO) program, in which SaRC is leading the Singapore Space Consortium. The first prototype of the VLEO platform, the Extremely Low Earth Imaging Technology Explorer (ELITE), is currently undergoing evaluation before the Flight Model is constructed. This initiative is a significant driver for our future efforts in space sustainability.



KEYNOTE SPEAKER

Local Time

11:30-12:00 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Jinjun Shan

York University, Canada

Speech Title: *Intelligent Autonomous Systems: Dynamics and Control*

Bio

Prof. Jinjun Shan is an internationally recognized expert in the areas of dynamics, control and navigation. He is a Full Professor of Space Engineering at the Department of Earth and Space Science and Engineering, York University. Prof. Shan received his Ph.D. degree from Harbin Institute of Technology, China, in 2002. His research progress is demonstrated through over 200 peer-reviewed journal and conference publications and 2 issued patents. Prof. Shan's accomplishments in research and engineering education have seen him recognized with prestigious recognitions such as the Fellow of Canadian Academy of Engineering (CAE), the Fellow of Engineering Institute of Canada (EIC), the Fellow of American Astronautical Society (AAS), and a member of European Academy of Sciences and Arts. He serves the profession as the Associate Editor for several field-leading journals including IEEE Transactions on Industrial Electronics, IEEE/ASME Transactions on Mechatronics, and the Journal of Franklin Institute, as well as numerous conference chairs.

Abstract

Autonomous systems are broadly prevalent in many sectors, from manufacturing, agriculture, traffic management to medical industry. While tremendous progress has been made over the last decade in autonomous systems, many challenges still exist. This requires advances in many aspects of vehicle autonomy, ranging from design to control, perception, planning, coordination, and human interaction. The autonomous systems operating in complex, dynamic, and interactive environments require artificial intelligence that rapidly adapts to unpredictable situations. In this seminar, Prof. Shan will present some recent research outcomes on Intelligent Autonomous Systems (UAVs, UGVs and self-driving cars) from his research group, Spacecraft Dynamics, Control and Navigation Laboratory (SDCNLab) at York University. These topics include payload transportation using UAVs, UAV trajectory generation, game-theoretic decision making for autonomous driving vehicles.



KEYNOTE SPEAKER

Local Time 14:00-14:30 | 2024.09.28 **Onsite Room** 2F · Banquet Hall A (二楼宴会A厅)**Wenhua Chen**

Loughborough University, UK

Speech Title: *Autonomous Forced Landing of Unmanned Aircraft Systems***Bio**

Wen-Hua Chen holds Chair in autonomous vehicles in the Department of Aeronautical and Automotive Engineering at Loughborough University, where he is also heading the Controls and Reliability Research Group. He is the Founding Director of Loughborough University Centre for Autonomous Systems specialised in unmanned aircraft systems and autonomous driving. He joined Loughborough as Lecturer in Flight Control Systems in 2000. Before that, he held teaching positions at the University of Glasgow, Scotland, and Nanjing University of Aeronautics and Astronautics, China. Dr Chen has a considerable experience in advanced control and signal processing and their applications in aerospace and automotive engineering. In the last 20 years, he has been spending most of his effort in developing autonomous system technologies and their applications in transport, defence, agriculture and environment. Prof Chen is a Chartered Engineer, and a Fellow of IEEE, the Institute of Engineering and Technology and the Institute of Mechanical Engineers, UK. He has published about 340 papers with over 20,000 citations. Currently he also holds the Established Career Fellowship of the Engineering and Physical Sciences Research Council (EPSRC), the most prestigious award by the UK government funding agencies.

Abstract

Unmanned aircraft systems are gradually penetrating into civil aviation, sharing airspace with manned aircraft. Safety is of paramount importance in future mixed aviation environment. Research has been carried out in addressing mid-air safety such as see and avoid, and safe separation, but much less on terminal operation and active contingency management. This talk focuses on autonomous landing particularly on forced landing in emergence. Different from a normal landing procedure consisting terminal area operation and autonomous taxiing, in an emergence situation such as engine-out or critical failure, a human pilot is trained to perform forced landing. It is essential to have similar functions on UAV to minimise the risk to the public and the damage of aircraft. We develop an autonomous forced landing function consisting of three layers: landing site selection, flight path planning and autopilot. Based on gliding performance and aircraft flight status, a reachability set approach is proposed to predict the maximum coverage of the aircraft. Then a decision-making tool is produced to identify and rank possible landing sites based on the likelihood of success landing and other factors. The path planning and autopilot design to cope with or exploit various wind conditions are considered under the recently proposed Goal-Oriented Control Systems framework.



KEYNOTE SPEAKER

Local Time

14:30-15:00 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Peijin Liu

Northwestern Polytechnical University, China

Speech Title: *Nonlinear Combustion Instability in Solid Rocket Motors*

Bio

Dr. LIU Peijin received B.Eng. (1994), M.Eng. (1997), and Ph.D. (2002) degrees in Aerospace Propulsion Theory and Engineering from Northwestern Polytechnical University in China. He is currently a Professor in School of Astronautics and a Vice Director in National Key Laboratory of Solid Rocket Propulsion at Northwestern Polytechnical University in Xi'an, China. From 2012-2018, he served as the Vice Dean at the School of Astronautics. From 2019-2023, he served as the Vice Dean at the Institute of Science and Technology in the university. His research interests include combustion process of propellants, combustion instabilities in propulsion system, and controlled energy release from solid fuels. Dr. Liu is the Director of solid propulsion Professional Committee of China Aerospace Propulsion Federation, and ranked in the Top 2% Most cited Scientists in 2023 by a Stanford University list.

Abstract



KEYNOTE SPEAKER

Local Time 15:00-15:30 | 2024.09.28 **Onsite Room** 2F · Banquet Hall A (二楼宴会A厅)



Olga Starinova

Samara University, Russia

Speech Title: *Nominal Control of Spacecraft with Low Thrusters in the Asteroid Vicinity*

Bio

O. L. Starinova is currently a professor at the Department of Spacecraft at Samara State Research University in Russia, head of the Department of Space Vehicle Dynamics and Control. Before joining Samara State Aerospace University in 1989, She worked as an engineer-researcher at the Central Specialized Design Bureau of Samara in the USSR.

Her research interests include flight dynamics and motion control of spacecraft with low thrust in gravitational fields of complex configuration and flight dynamics and motion control of spacecraft with solar sails. She has authored and coauthored more than 250 articles.

O. L. Starinova is Member of International Academy of Navigation and Motion Control, Member of Russian academy of Cosmonautics named K.E. Tsiolkovsky, Member of Academy of Aeronautic and Astronautic France, adviser to the Russian Engineering Academy. She is the recipient of the 2012 Medal of Alexander Humboldt of the European Academy of Natural Science, the 2015 Medal of Sergey Pavlovich Korolev of the Cosmonautics Federation of Russia, the 2015 Medal of Carl Friedrich Gauss of the European Academy of Natural Science, the 2022 Badge Honored Worker in the Youth Policy Field of the Science and Education Ministry of Russian Federation.

Abstract

Studies of planetary satellites, asteroids, interplanetary and near-solar space provide an opportunity to get answers to many fundamental questions and use the achievements of cosmonautics in the development of virtually unlimited resources of the Solar system. The use of advanced electric propulsion systems (EPS) makes it possible to significantly reduce the consumption of the working fluid for flights and thereby increase the efficiency of research missions of spacecraft. However, the use of spacecraft from the EPS for missions to small bodies of the Solar System is hampered by the weak development of the methodology for the formation of nominal control in the vicinity of irregularly shaped bodies, which include many small bodies of the Solar System.

The lack of a methodology for the preliminary formation of nominal control on an object-centered section of traffic leads to significant uncertainties in determining the fuel mass reserve required to fulfill the planned mission program. This work is devoted to solving this problem.

The formation of a motion control program during mission planning is complicated by incomplete knowledge of the asteroid's gravity. As a mathematical model of the gravitational potential of an asteroid, a superposition of N attracting points rotating with the asteroid's own angular velocity at a constant distance is used. Nominal control for target maneuvers is formed on the basis of a combination of locally optimal control laws and a developed algorithm for relay switching between them with a dead zone and "hysteresis". The results of modeling the spacecraft motion in the vicinity of asteroid 433 Eros are presented.



INVITED SPEAKER

Local Time 16:00-16:20 | 2024.09.28 **Onsite Room** 2F · Banquet Hall A (二楼宴会A厅)**Ivan Tkachenko**

Samara University, Russia

Speech Title: *Methodological Approaches to the Creation and Functioning of Serial Robotic Production of Small Spacecrafts***Bio**

Ivan Tkachenko, Deputy Rector, Director of the Institute of Aviation and Rocket and Space Technology of Samara University, Ph.D., Associate Professor. A specialist in the development of small spacecraft and their constellations. The head of the project for the creation of the university small satellites' constellation of the "AIST" series. Currently, a project is being implemented to develop technologies for serial robotic satellite production, the results of which will be implemented at Roscosmos enterprises.

Abstract

The research considers a systematic approach to the creation of robotic production of small nano-class spacecraft to ensure their serial production. The analysis of key trends in the creation and development of modern spacecraft manufacturing is carried out, the factors characterising serial robotic production are identified and systematised. The intellectual production cell as the main element of serial robotic production of matrix type is described. The main types of design and engineering solutions aimed at adapting the design of a small spacecraft for robotic assembly are presented. There is a description of the project on creation of a prototype of serial production of small spacecraft in the format of cyberphysical factory, implemented in the advanced aerospace engineering school of Samara University.



INVITED SPEAKER

Local Time

16:20-16:40 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Lei Lei

Nanjing University of Aeronautics and Astronautics, China

Speech Title: *Research on Intelligent Cooperation Theory of Unmanned Aerial Vehicular Swarms Based on Digital Twins*

Bio

Abstract



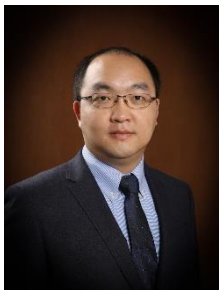
INVITED SPEAKER

Local Time

16:40-17:00 | 2024.09.28

Onsite Room

2F · Banquet Hall A (二楼宴会A厅)



Weitao Wu

Nanjing University of Science and Technology, China

Speech Title: *Physics Informed Machine Learning in Fluid Flow and Heat Transfer*

Bio

Dr. Wei-Tao Wu is a professor in School of Mechanical Engineering at Nanjing University of Science and Technology. Dr. Wu received his Ph.D. degree from the Department of Mechanical Engineering of Carnegie Mellon University, USA, and his B.S. degree from Xi'an Jiaotong University, China. Dr. Wu's research interests lie in multiphase flow, non-Newtonian fluid, aerodynamics and physics-informed machine learning. His work covers mathematical modeling, computational simulation and data mining. Within recent 5 years, Dr. Wu has authored or co-authored over 100 peer-reviewed journal papers, and he has also served as an editorial board member of Fluids and a member of Physics and Aerodynamics Committee of Chinese Aerodynamics Research Society.

Abstract

Flow and heat transfer phenomena widely exist in industry and nature. Nowadays, researchers have been able to obtain high-precision physical fields by computational or experimental techniques, which helps the understanding of the mechanism or the guidance of the engineering design. Through decades of studies, although people have accumulated huge size of computational and experimental data, when working on a new problems even similar problem with different conditions, usually it is still necessary to re-simulate or re-experiment. In recent years, deep learning has demonstrated great ability on extracting features from thus accurately predicting physical fields, and prediction speed by deep learning is usually several orders of magnitude faster. This presentation aims to discuss the recent advances of our group in physics informed machine learning in fluid flow and heat transfer.



Onsite Oral Session 1

Topic: Aerospace Materials and Mechanical Properties Analysis
Session Chair:

Local Time09:00-10:45 | 2024.09.28Onsite Room2F · Lu Yuan (二楼禄园厅)

Time	ID	Presenter	Affiliation
09:00-09:15	C002-A	Yang Yang	Nanjing University of Aeronautics and Astronautics, China
09:15-09:30	C018-A	Bocheng Zhou	Harbin Engineering University, China
09:30-09:45	C088	Songlin Pang	Nanjing University of Science and Technology, China
09:45-10:00	C081	Congwen Gui	Nanjing University of Aeronautics and Astronautics, China
10:00-10:15	C136	Zhi Qu	Nanjing University of Science and Technology, China
10:15-10:30	C045	Zizheng Chen	Harbin Engineering University, China
10:30-10:45	C139	An Qing	Nanjing University of Science and Technology, China

Details:

Paper ID	Title, Authors
C002-A	The Influence of Preload on Load Distribution Uniformity in Composite Multi-Bolt Structures <i>Yang Yang, Luling An</i>
C018-A	Experimental Study of Planar Expansion Deflection Nozzle Flow Under Variation Total Pressure <i>Bocheng Zhou, Ben Guan, Shuai Wang, Yan Chen, Ge Wang</i>
C088	Research on Hypervelocity Impact on Honeycomb Sandwich Panel with Multiple Insulation Layer <i>Songlin Pang, Jinsheng Xu, Xiong Chen, Ivan Tkachenko, Danhe Chen, Maksim Ivanushkin</i>
C081	Data-driven Prediction Method for Multiaxial Fatigue of Metallic Materials based on Back Propagation Neural Network <i>Congwen Gui, Zhirong Wu</i>
C136	Research on the Mechanical Properties of PEEK-based Gyroid Structures under High and Low Temperature Cycling <i>Dawei Li, Zhi Qu, Gang Wang, Wenhe Liao</i>



C045	Numerical Investigation on the Factors in Fluencing Local Supersonic Ring in the Micronozzle <i>Zizheng Chen, GeWang, Haiwei Yang</i>
C139	Honeycomb-based and Sheet-gyroid-based Electromagnetic Metastructure: Conformal Design and Anisotropic Analysis <i>Qing An, Dawei Li, Chengtao Sun, Weiping Li, Wenhe Liao, Tingting Liu</i>



Onsite Oral Session 2

Topic: Aircraft Control and Aerodynamic Analysis

Session Chair:

Local Time09:00-10:45 | 2024.09.28

Onsite Room2F · Qin Yuan (二楼沁园厅)

Time	ID	Presenter	Affiliation
09:00-09:15	C065-A	Jiaqi Liu	Xiamen University, China
09:15-09:30	C028	Zai Yu	Nanjing University of Science and Technology, China
09:30-09:45	C103	Peiqiang Tian	National Key Laboratory of Strength and Structural Integrity, Aircraft Strength Research Institute of China, China
09:45-10:00	C112	Achraf Assila	Nanjing University of Aeronautics and Astronautics, China
10:00-10:15	C110	Yajuan Zhang	National Key Laboratory of Strength and Structural Integrity, Aircraft Strength Research Institute of China, China
10:15-10:30	C030	Boyang Zhang	Nanjing University of Science and Technology, China
10:30-10:45	C148	Junhao Lei	Nanjing University of Aeronautics and Astronautics, China

Details:

Paper ID	Title, Authors
C065-A	Aerodynamic Shape Optimization of High-speed Helicopter Rotor Airfoil Based on Deep learning <i>Jiaqi Liu, Rongqian Chen, Yancheng You</i>
C028	Launch Separation Simulation and Sensitivity Analysis in Space Environment <i>Zai Yu, Hanyu Deng, Haibo Yang, Wenhe Liao, Mingxiao Wang, Jing Guo</i>
C103	Environmental Response Analysis of Aircraft Doors in Extreme Flight Temperature Environments <i>Peiqiang Tian, Zhanpeng Ren, Yajuan Zhang, Hui Zhang, Jingtao Wu</i>
C112	Optimization of Interval Tasks for Civil Aircraft with Hidden Non-Safety Failures <i>Achraf Assila, Cai Jing, Lai Tao</i>
C110	Analysis and Test of the Flow Field in the Dc Open Wind Tunnel of a Large Climate Laboratory Large Climate Laboratory <i>Yajuan Zhang, Bin Li, Jingtao Wu, Zhanpeng Ren, Peiqiang Tian</i>

C030	Study on Proximity Operations Methods for Spacecraft in Multi-constraint Pursuit-Escort Scenarios <i>Boyang Zhang, Shuhui Fan, Xiang Zhang</i>
C148	Direct Thrust Predictive Control of Air-Driven Ducted Fan Based on Composite Nonlinear Prediction Model <i>Junhao Lei, Xianghua Huang, Tianhong Zhang, Qiyuan Zhang</i>



Onsite Oral Session 3

Topic: New Propulsion Technology Based on Combustion Mode

Session Chair:

Local Time09:00-10:45 | 2024.09.28

Onsite Room2F · De Yuan (二楼德园厅)

Time	ID	Presenter	Affiliation
09:00-09:15	C076	Ping Liu	EPCL Xianghong (Hunan) Machinery & Chemical Co, Yueyang, China
09:15-09:30	C168-A	Xiaodong Cai	National University of Defense Technology, China
09:30-09:45	C123	Lei Ren	Nanjing University of Aeronautics and Astronautics, China
09:45-10:00	C170-A	Xiaodong Cai	National University of Defense Technology, China
10:00-10:15	C158	Jiaqi Wei	Tianmushan Laboratory, China
10:15-10:30	C159	Jiacheng Shi	Hangzhou Dianzi University, China
10:30-10:45	C171-A	Lantian Li	National University of Defense Technology, China

Details:

Paper ID	Title, Authors
C076	Direct Force Pulser Ignition Response and Thermal Safety Research <i>Ping Liu</i>
C168-A	Experimental Research on a Novel Pressure-gain Combustion Mode Based on Resonance Enhancement Mechanism <i>Rong Hong, Jianhan Liang, Xiaodong Cai, Han He, Yuqi Wang, Kaiyan Jin</i>
C123	Thermal Performance Enhancement of a Rectangular Channel with Dual Grooves <i>Lei Ren, Daren Zheng, Jianhong Sun</i>
C170-A	Investigation of Flow Boiling Heat Transfer Mechanisms in Channels with Non-Uniform Heating and Complex Wall Configurations <i>Shilin Yu, Xiaodong Cai, Wandong Zhao, Ning Wang, Jian Chen</i>
C158	The Influence of Channel Structure on the Flow and Heat Transfer Characteristics of Supercritical Aviation Fuel in PCHE <i>Jiaqi Wei, Jianqin Zhu, Zeyuan Cheng, Yongkang Wu, Yuanzi Wu</i>
C159	A Modified Gaussian Process on Temperature Compensation of Zirconia Sensor <i>Jiacheng Shi, Xiaolong Zheng, Guo Zheng, Zhenping Zhao, Chao Huang, Liang Zheng</i>

C171-A	Analysis of Aerodynamic Choking in Injected Mixed Flow Field Under Low Supersonic Incoming Flow Conditions <i>Lantian li, Jianhan Liang, Xiaodong Cai</i>
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Onsite Oral Session 4

Topic: Aviation Communication System and Control Technology
Session Chair:

Local Time11:00-12:30 | 2024.09.28Onsite Room2F · Lu Yuan (二楼禄园厅)

Time	ID	Presenter	Affiliation
11:00-11:15	C007	Jun Wu	National University of Defense Technology, China
11:15-11:30	C042	Xiaohua Zhang	Nanyang Technological University, Singapore
11:30-11:45	C060	Yao Xiao	National University of Defense Technology, China
11:45-12:00	C095	Zechen Xu	China Satellite Maritime Tracking and Control Department, China
12:00-12:15	C037	Xiaohui Li	China Academy of Aerospace Aerodynamics, China
12:15-12:30	C116	Yanan Wang	Nanjing University of Aeronautics and Astronautics, China

Details:

Paper ID	Title, Authors
C007	Design of Fully Integrated Quasi-2D Platelike Microsatellites <i>Jun Wu, Hongbing Wang, Chenyang Luo, Zhu Sun, Guohua Zhou, Kaiwu Tu</i>
C042	Star Tracker Installation Strategy and Visibility Analysis for ELITE Mission in VLEO <i>Xiaohua Zhang, Wenxu Han, Shu Yang, Keck Voon Ling, Wee Seng Lim, Wenhe Liao, Zhengliang Lu, Xiang Zhang</i>
C060	Fully-Connected LEO Hybrid Constellation Design with Global Uniform Coverage <i>Yao Xiao, Shuai Guo, Yazhong Luo</i>
C095	Research of Shipborne Radar Calibration Technology Based on Tianping-1 Satellite <i>Guo Caifa, Xu Zechen, Chen Hongying, Gu Fufei</i>
C037	Experimental Study on the Spatial Characteristics of Hypersonic Gap-compression Ramp Shock Wave Boundary/layer Interaction <i>Xiaohui Li, Hongliang Xiong, Hongwei Wang, Zhan Huang, Shaojie Ren, Weilong Shi</i>
C116	Research on Terminal Guidance Control of a Certain Type of Suicide Drone <i>Yanan Wang, Zheng Gong, Yalei Bai, Yi Yang</i>

Onsite Oral Session 5

Topic: Aeroengine Model and Control
Session Chair:

Local Time11:00-12:30 | 2024.09.28Onsite Room2F · Qin Yuan (二楼沁园厅)

Time	ID	Presenter	Affiliation
11:00-11:15	C140	Qiao Liu	Nanjing University of Aeronautics and Astronautics, China
11:15-11:30	C016	Ming Zhu	Nanjing University of Science and Technology, China
11:30-11:45	C156	Qiyuan Zhang	Nanjing University of Aeronautics and Astronautics, China
11:45-12:00	C035	Luhao Wang	Nanjing University of Science and Technology, China
12:00-12:15	C064	Changqing Fang	Shanghai Space Propulsion Technology Research Institute, China
12:15-12:30	C126	Yan Huo	Nanjing University of Aeronautics and Astronautics, China

Details:

Paper ID	Title, Authors
C140	Aeroengine EGT and Its Short-term Trend Prediction <i>Qiao Liu, Xianghua Huang, Tianhong Zhang, Fuhui Lv</i>
C016	Comparison of Response Time for Pressure of Pintle Solid Rocket Motor Under Different Controllers <i>Ming Zhu, Weixuan Li, Yingkun Li, Xiong Chen, Haifeng Xue</i>
C156	Research on Modeling and Control Method of the Mode Transition for High-Flow Variable Cycle Engine <i>Qiyuan Zhang, Xianghua Huang, Runmin Ji, Junhao Lei</i>
C035	Simulation Study on the Internal Flow Field of Solid Fuel Ramjet Engine with Central Cone <i>Luhao Wang, Weixuan Li, Xiong Chen, Changsheng Zhou</i>
C064	A Method for Determining Flame Width of Underwater Solid Rocket Motor by Image Processing Using Mathematica <i>Changqing Fang, Chao Yin, Jie Wang, Yongchun Lou, Yu Zhao, Jianping Gu</i>
C126	Safety Analyses of Cylinder Ejection Process in Different Conditions <i>Yan Huo, Jianhong Sun, Daren Zheng, Weidong Zhao, Zhi Sun, Pei Li</i>

Online Oral Session 6

Topic: Aircraft Model and System Control
Session Chair:

Local Time

08:45-10:45 | 2024.09.29

Online Room ID

889 0912 6918

Online Link

<https://us02web.zoom.us/j/88909126918>

Time	ID	Presenter	Affiliation
08:45-09:00	C061	Miao Dong	Nanjing University of Aeronautics and Astronautics, China
09:00-09:15	C021	Zizhuo Cai	Beihang University, China
09:15-09:30	C068	Nvzi Bao	Anhui Xinhua University, China
09:30-09:45	C085	Jingyi Kang	Harbin Institute of Technology, China
09:45-10:00	C093	S.A. Melnikov	Samara National Research University, Russian
10:00-10:15	C120	Junyao Wan	Nanjing University of Aeronautics and Astronautics, China
10:15-10:30	C135	Qiujie Shen	Bauman Moscow State Technical University, Russia
10:30-10:45	C145	Jun Li	AVIC Aerospace Life-support Industries LTD, China

Details:

Paper ID	Title, Authors
C061	Vibration Damping Research on Cable and Fluid Piping system for High-precision Tracking and Pointing Device <i>Miao Dong, Chen Wang, Jingbao Chen, Zihao Zhang</i>
C021	Research on the Dynamic Response on Quadrotor Subjected to Blast Impact Loading of Specialized Mechanical Device <i>Zizhuo Cai, Gaoyu Liang, Maria Selezneva, Mo Yang</i>
C068	Active-passive Coupling Control Method to Reduce Aerodynamic Noise of Airfoil at High Angle of Attack <i>Nvzi Bao, Chenghao Yang, Aonan Zhang, Zhoujian Shao</i>
C085	Adaptive Attitude Control of a Satellite with Bilateral Rotating Solar Arrays <i>Jingyi Kang, Wenlai Ma, Shengyu Lin</i>
C093	Method for Calculating the Parameters of an Axial Microturbine at the Initial Design Steps

	<i>A.I. Shcherban, S.A. Melnikov, V.M. Zubanov, E.S. Goryachkin</i>
C120	Rapid Simulation and Analysis of Flight Dynamics Based on Modelica <i>Junyao Wan, Haibo Jin</i>
C135	Design of the “Sky Watcher” Intelligent Anti-Drone System <i>Qiujie Shen, Shengshuo Gong, Oleg Varlamov</i>
C145	Aircraft Canopy Jettisoning Shock Waves for Auditory Organ During Ejection Rescue <i>Jun Li, Wujun Xie, Hui Li, Guanjun Huang</i>



Online Oral Session 7

Topic: Aerospace Engine Design and Power System Parameter Analysis

Session Chair:

Local Time 11:00-13:00 | 2024.09.29

Online Room ID 889 0912 6918

Online Link <https://us02web.zoom.us/j/88909126918>

Time	ID	Presenter	Affiliation
11:00-11:15	C083	Liu Xin	Samara National Research University, Russian
11:15-11:30	C012	Mingkai Huang	Bauman Moscow State Technical University, Russian Federation
11:30-11:45	C092	O.V. Baturin	Samara National Research University, Russian
11:45-12:00	C133	Shengshuo Gong	Bauman Moscow State Technical University, Russia
12:00-12:15	C098	Junjie Liu	Samara University, Russian
12:15-12:30	C143	Chenmin Gao	Northwestern Polytechnical University, China
12:30-12:45	C099	I. A. Kupriev	Samara University, Russian
12:45-13:00	C118	Shuailong Gao	Nanjing University of Science and Technology, China

Details:

Paper ID	Title, Authors
C083	Research on Thermodynamics Comprehensive Analysis Method Considering the Life Cycle of Turbofan Engine <i>Xin Liu, Oleg Baturin, Grigorii Popov, Valeriy Matveev</i>
C012	Method for Calibrating Navigation Errors autonomously Using GNSS Technology <i>Huang Mingkai, Zhang Xianjian, K.A. Neusypin, M.C. Selezneva</i>
C092	Improved Algorithm for Design Thermodynamic Calculation of Axial Turbomachinery Parameters of Core Engine of a Single-shaft Turboprop Engine <i>G. M. Popov, V. N. Matveev, V.M. Zubanov, O.V. Baturin</i>
C133	Determining the Optimal Aerodynamic Quality of a Re-entry Capsule in the Atmosphere Based on Reinforcement Learning <i>Shengshuo Gong, Qiujie Shen, Oleg Varlamov</i>
C098	Research Calculating of Micro Gas Turbine Engine Heat Exchanger <i>Junjie Liu, D. A. Uglanov, Naresh Kedam, A. A. Shimanov, Lopatin A. L, Jiqiang Wang</i>



C143	The Accurate Prediction Model on the Descent Segment of Solid Rocket Motor Interior Ballistic <i>Gao Chenmin, Lei Zheng, Wang Kaixuan, Sun Lin, Bao Futing</i>
C099	Characterization of a Solar Collector-Heat Exchanger for The Regasification of The Working Fluid on Space Vehicles <i>Junjie Liu, D. A. Uglanov, A. B. Shimanova, A. A. Shimanov, I. A. Kupriev, Guanghua Zheng</i>
C118	Numerical Simulation of Aerodynamic Pressure and Aerodynamic Heat on Stagnation Point and Wall of Hypersonic Double Cone Aircraft <i>Shuailong Gao, Feiyin Li, Shaojie Ma, Tong Tang</i>



Poster Session

Topic: Power Equipment Design, System Modeling, and Reliability Analysis in Aerospace Engineering
Session Chair:

Local Time11:00-12:45 | 2024.09.29Onsite Room2F· Foyer (二楼走廊)

Order	ID	Presenter	Affiliation
1	C001	Hang Zhou	Northwestern Polytechnical University, China
2	C024	Yimin Cheng	Nanjing University of Science and Technology, China
3	C019	Jiheng Pan	Nanjing University of Aeronautics and Astronautics, China
4	C025	Xuyang Wang	Nanjing University of Science and Technology, China
5	C026-A	Zhibang Wang	Harbin Engineering University, China
6	C047	Weimin Huang	Nanjing University of Science and Technology, China
7	C050	Nannan Wang	Beijing Institute of Technology, China
8	C052	Yan He	Nanjing University of Science and Technology, China
9	C056	Yinghe Yuan	Nanjing University of Science and Technology, China
10	C058	Menglong Zhang	Nanjing University of Science and Technology, China
11	C062	Chunbo Wu	Nanjing University of Science and Technology, China
12	C096	Junjie Sun	Beihang University, China
13	C070	Zuoyang Song	Nanjing University of Science and Technology, China
14	C106	Hong Zhang	Zhejiang University of Technology, China; Ningbo Institute of Materials Technology & Engineering, China
15	C071	Xudong Yang	Nanjing University of Science and Technology, China
16	C072	Yongben Lu	Nanjing University of Science and Technology, China
17	C079	Jiahao He	Nanjing University of Science and Technology, China
18	C101	Hao Lu	Nanjing University of Science and Technology, China

19	C105	Jiacong Zheng	Zhejiang University of Technology, China; Ningbo Institute of Materials Technology & Engineering, China
20	C108	Congyuan Qu	Nanjing University of Science and Technology, China
21	C113	Shizhuo Hou	Nanjing University of Science and Technology, China
22	C117	Xusheng Wang	Beihang University, China
23	C125	Shijie Yang	Nanjing University of Science and Technology, China
24	C129	Jiangzhi Lin	Nanjing University of Science and Technology, China
25	C151	Yong Liu	Shanghai Spaceflight Precision Machinery Institute, China
26	C163	Jingqiang Gao	Nanjing University of Science and Technology, China
27	C165	Zhanxiao Liu	Nanjing University of Science and Technology, China
28	C166	Xing Gao	Hiwing Aviation General Equipment Co., Ltd, China
29	C015	Zhenshuang Zhang	Nanjing University of Science and Technology, China

Details:

Paper ID	Title, Authors
C001	Research Progress on Aircraft Landing Gear Dynamics Modeling and Simulation Methods <i>Hang Zhou, Yongjie Zhang, Linyin Luo, Jiyong Sun, Lei Ren</i>
C024	Structural Integrity Evaluation Technique of Charge Based on Abaqus Secondary Development <i>Cheng Yi-min, XU Jin-sheng, HUANG Wei, WANG Yan, REN Xiao-bin</i>
C019	Numerical Analysis on Icing Characteristics of Supercooled Large Droplets on Rotating Hood Model <i>Jiheng Pan, Yaping Hu, Dongyin Yu, Yuetao Jiang, Changxian Zhang, Jiangnan Zhu</i>
C025	Three-dimensional Numerical Study and Model Optimization of Motors Interface Mode I Failure <i>WANG Xu-yang, XU Jin-sheng, HUANG Wei, WANG Yan, REN Xiao-bin</i>
C026-A	Numerical Investigation on Combustion Enhancement Strategy in Shock Concentric Bubble Interaction <i>Zhibang Wang, Ben Guan, Yan Chen, Shuai Wang, Ge Wang</i>
C047	Design and Optimization of Scramjet Overall Scheme <i>Yue Rong, Zheng Chen, Weimin Huang, Wenxiang Cai</i>



C050	Numerical Investigation of Aerodynamic Characteristics of a Missile with “×” Type Layout <i>Nannan Wang, Jianwei Lv, Minzhong Yuan, Jiaqi Yu, Yue Yu, Guoqing Zhang</i>
C052	The Influence of the Starting point of the Upper Wall Expansion Region and the Relative Position of the Oblique Detonation Wave on the Combustion Characteristics of the Oblique Detonation <i>Yan He, Sheng Li, Shuo Chen, Hu Ma, Zhenjuan Xia</i>
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ATTRACTIONS IN NANJING

Nanjing, the capital city of Jiangsu Province in China, is a city with a rich history and vibrant modern culture. It is famously known as one of the "Four Great Ancient Capitals of China," boasting a history spanning over 2,500 years. The city's name, Nanjing, literally means "Southern Capital," reflecting its historical importance as the seat of power for various dynasties, including the Ming Dynasty in the early 14th century. Nanjing is renowned for its numerous historical sites and cultural relics. The Ming Xiaoling Mausoleum, located in the eastern suburbs, is a magnificent example of Ming Dynasty architecture and is listed as a UNESCO World Heritage Site. The City Wall of Nanjing, one of the largest and most complete ancient city walls in China, encircles the old city, offering a glimpse into the city's defensive history. The city is also home to the prestigious Nanjing University, one of China's oldest and most esteemed institutions of higher learning, contributing to its intellectual and academic reputation. With its blend of ancient history and modern development, Nanjing stands as a testament to China's rich cultural heritage and rapid progress, making it an essential destination for travelers and scholars alike.

Dr. Sun Yat-sen's Mausoleum 中山陵



Dr. Sun Yat-sen's Mausoleum, nestled in the picturesque landscapes of Nanjing, Jiangsu Province, stands as a majestic tribute to Dr. Sun Yat-sen, the founding father of modern China. Completed in 1929, this iconic landmark embodies the revolutionary spirit and vision of Sun Yat-sen, who proposed the Three Principles of the People, fundamentally shaping China's democratic path. Designed by renowned architect Lv Yanzhi, the mausoleum is an impressive blend of traditional Chinese architectural elements and modern design principles. The entire complex spans over a vast area, with a 480-meter-long tomb path lined with towering cedars and cypresses, symbolizing eternity and reverence. At the end of this path, the main building rises gracefully, its blue-glazed tiles glistening in the sun. The interior of the mausoleum is equally awe-inspiring, with the Great Hall of Ceremonies serving as the focal point. Here, Sun Yat-sen's coffin rests, surrounded by solemnity and respect. The hall's intricate design and impeccable craftsmanship reflect the high esteem in which Sun Yat-sen is held by the Chinese people.



Nanjing Museum 南京博物院



Nanjing Museum is located in Nanjing, the capital of Jiangsu Province in East China. With an area of 70,000 square metres (17 acres), it is one of the largest museums in China, with over 400,000 items in its permanent collection. Especially notable is the museum's enormous collections of Ming and Qing imperial porcelain, which is among the largest in the world. As one of China's largest and most prestigious museums, it showcases a breathtaking array of artifacts that illuminate the rich tapestry of the nation's past. From ancient bronzes and exquisite jade carvings to intricate ceramics and magnificent calligraphy, each exhibit tells a unique story, weaving together the narrative of China's civilization. The museum boasts extensive galleries dedicated to various eras and themes, including prehistoric relics, ancient Chinese art, and even special exhibitions that highlight cultural exchanges and innovations. Visitors are invited on a journey through time, from the dawn of humanity in Jiangsu Province to the vibrant dynasties that shaped China's identity. Notably, the museum's digital displays and interactive exhibits enhance the visitor experience, making ancient histories come alive in innovative ways. The spacious grounds and elegant architecture, inspired by traditional Chinese design, create a serene atmosphere conducive to contemplation and learning. Moreover, Nanjing Museum actively engages in research, conservation, and education, fostering a deeper understanding and appreciation of China's cultural heritage among both domestic and international audiences. It is not just a museum; it is a living testament to the continuity and vitality of Chinese civilization, inviting all to explore, discover, and be inspired by the profound beauty and wisdom of the past.

Ming Xiaoling Mausoleum 明孝陵



Ming Xiaoling Mausoleum, where Emperor Ming Taizu (respected title of Emperor Zhu Yuanzhang) and his queen were buried, lies at the northern foot of Mount Zijin (Mount Purple Gold), adjacent to Dr. Sun Yat-sen's Mausoleum on the east and Meihua (Chinese Plum) Mountain on the south. With a more than 22.5 kilometers wall, the mausoleum is the largest emperor mausoleum in Nanjing. Most of its ground wood-structured buildings were destroyed in 1853, with the brick and stone buildings still existent including Rectangular city, Inner Red Gate and Jinyue Tablet. The sacred way started from Sifangchang (Rectangular city) which was a pavilion where a splendid carved stone stele for memory of Emperor Zhu Yuanzhang was enshrined, on which hymn by his fourth son was inscribed. Now, the top of the pavilion was gone. In the middle of the 1800-meter-long winding sacred way, there are 6 kinds and 12 pairs of animals guarding the tomb. Further beyond is a pair of decorative columns called Huabiao in Chinese. Four couples of ministers and generals have been standing



there for centuries to accompany their His Majesty beneath. On an inscribed stone tablet outside of the gate of the mausoleum, an official notification of the local government in the Qing dynasty (1644-1911) ordered to protect the tomb. Inside of the gate, there is a pavilion in which 5 steles stand. The one in the middle was inscribed with 4 Chinese characters, which was written by Emperor Kangxi in his third inspection tour. Behind the pavilion, there used to be other annexes, however most of them collapsed into relics from which the original splendor can still be traced

Jiming Temple 鸡鸣寺



Jiming Temple is a renowned Buddhist temple in Nanjing, Jiangsu, China. One of the oldest temples in Nanjing, it is located in the Xuanwu District near Xuanwu Lake. Nestled gracefully on the eastern slope of Jilong Hill in the heart of Nanjing's Xuanwu District, Jiming Temple stands as a testament to over 1,700 years of Buddhist history and cultural heritage. Known both for its serene ambiance and strategic location overlooking the picturesque Xuanwu Lake, this ancient temple is a must-visit destination for travelers seeking spiritual solace and a glimpse into China's rich Buddhist traditions. Founded during the Yongkang era of the Western Jin Dynasty (300 AD), Jiming Temple has undergone numerous reconstructions throughout history, with the most notable being the construction of Tongtai Temple by Emperor Wu of Liang in 527 AD. Though Tongtai Temple was later destroyed, its legacy lived on, inspiring the reconstruction of Jiming Temple in 1387, which has stood the test of time to become a beloved landmark in Nanjing. The temple's architectural ensemble showcases a harmonious blend of ancient Chinese architectural styles, with main structures such as the Grand Hall of the Great Buddha, the Guanyin Hall, and the Sutra Depository Tower exuding an air of tranquility and reverence. At the heart of the complex lies the Bell Tower, its chiming bells echoing through the air, invoking a sense of peace and calm. Beyond its physical beauty, Jiming Temple is a vibrant hub of Buddhist activities and cultural exchanges. Visitors can participate in prayers, meditation sessions, and blessings, immersing themselves in the rich spiritual atmosphere that pervades the temple grounds. The temple also houses a collection of rare Buddhist scriptures and artifacts, offering a window into the depth and complexity of Chinese Buddhist art and philosophy.

Xuanwu Lake 玄武湖



Xuanwu Lake, located in the heart of Nanjing, China's eastern metropolis, is a breathtaking natural and cultural treasure trove. Nestled between the majestic Zijin Mountain to the east and the historic Ming City Wall to the south, Xuanwu Lake boasts a rich history spanning over 1,500 years. This scenic lake is not only the largest



comprehensive park in Nanjing but also one of the most significant royal gardens in southern China. Covering an area of 5.13 square kilometers, with a lake surface area of 3.78 square kilometers, Xuanwu Lake is renowned as the "Pearl of Jinling" or the "Bright Pearl of Nanjing." It is divided into three major sections: the Northern Lake, the Southeastern Lake, and the Southwestern Lake, each offering unique vistas and attractions. The lake is surrounded by five picturesque islets, namely Huanzhou, Yingzhou, Liangzhou, Cuizhou, and Lingzhou, all interconnected by bridges and embankments. During different seasons, these islets come alive with vibrant colors, from the blush of cherry blossoms in spring to the golden hues of autumn leaves. Xuanwu Lake's allure extends beyond its natural beauty. It is steeped in history, having served as a royal garden during the Six Dynasties and a storage facility for national records during the Ming Dynasty. The area is dotted with historical sites, including the Ming City Wall, the Lama Temple, and the ancient reading terrace built by Prince Liangzhaoming during the Liang Dynasty. In recent years, Xuanwu Lake has undergone extensive renovations, making it an even more attractive destination for locals and tourists alike. The newly unveiled "New Xuanwu Lake Eight Scenic Spots" showcase the lake's unique charm, blending history, culture, and natural scenery. These include the "Military Review by the Lake," the "Water Gate of Wisdom," and the "Willow-lined Path by the Lake," among others. Visitors can enjoy a leisurely stroll along the 9.8-kilometer lakeside promenade, taking in the stunning views of the lake and the surrounding mountains. The park is also a popular spot for various recreational activities, such as boating, fishing, and bird-watching.

Qinhuai River 秦淮河



Qinhuai River, a timeless ribbon weaving through the heart of Nanjing, China, is more than just a waterway; it is a living testament to the city's rich history, vibrant culture, and enduring charm. This historic river, often referred to as the "Mother River of Nanjing," has been a witness to countless dynasties, literary masterpieces, and romantic tales. Originating from the Baoshan Mountain in the south, the Qinhuai River flows northward, eventually merging with the Yangtze River. Along its course, it has nurtured the growth of Nanjing, once the capital of six ancient dynasties, imbuing the city with a unique blend of elegance and nostalgia. The riverbanks are lined with ancient streets, bridges, and architectural marvels that exude a sense of timelessness. Qinhuai Scenic Area, centered around the river, is a popular tourist destination, where visitors can stroll along the bustling streets, admire the beautifully preserved ancient buildings, and indulge in local delicacies. The Qinhuai River is also renowned for its nightlife, particularly during the annual Lantern Festival. The riverfront comes alive with a sea of colorful lanterns, illuminating the water's surface and creating a mesmerizing spectacle. It's a time when traditional Chinese culture comes to the fore, with performances of Kunqu Opera, folk music, and dragon dances, all adding to the festive atmosphere.



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MEMO

