

ICAS 2024

*Sharing Research to Strengthen
Innovation in Aeronautics and Aviation*

Call for Papers

34th Congress of the
International Council of
the Aeronautical Sciences

ICAS



Florence

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September 9-13

20
24 ITALY



Please submit your abstract online at

www.icas.org

before 1 January 2024

**PROUDLY HOSTED BY
THE ITALIAN ASSOCIATION OF
AERONAUTICS AND ASTRONAUTICS**

www.icas2024.com



It is with great pleasure that we invite you to participate in the 34th Congress of the International Council of the Aeronautical Sciences (ICAS). ICAS was established in 1957 under the leadership of Professor Theodore von Kármán. Today ICAS continues to support the work of aerospace professional Member Societies around the world. Through Associate Memberships, ICAS brings together aerospace companies, national laboratories and educational institutions.

The 2024 ICAS Congress will be held in Florence, Italy, from 9 to 13 September 2024: we will be hosted by one of the premier aerospace nations in a city famed for its creativity since Renaissance times. In Florence we will build on the great success of the 2022 Stockholm Congress, where our global aerospace community was able to meet face-to-face for the first time in four years and reflect on the momentous events of 2020-2022. The Stockholm programme was boosted by the invited participation of leading researchers, designers, managers and policymakers who were able to share their strategic vision for the future of aerospace with our delegates: the same will happen in Florence, as our world faces challenges which were unimaginable in 2022, while continuing to strive for a sustainable future.

The ICAS Congress has three distinctive characteristics: it is multi-disciplinary, recognising that major advances must involve experts working together across a range of specialisms; it recognises that social interaction and conviviality are essential ingredients of knowledge exchange, and are enhanced by selecting culturally rich settings for our Congresses; and it offers unparalleled opportunities for early career researchers to develop their network and to make a real contribution to international collaboration. The unique atmosphere of an ICAS Congress builds life-long collaboration, mutual understanding and international friendship, while sending a strong message to society that our global community is working together to solve global challenges.

For 2024 we particularly welcome papers which cross over between the traditional topic areas listed later in this call, and which bring in ideas from other sectors, especially novel concepts in energy, control, materials and the increased gathering and use of data, particularly where the certification of these disruptive technologies is addressed.

We very much look forward to seeing you in Florence in 2024 and to hearing about your contribution to solving the challenges facing our industry, be it novel ideas or new ways of working. Please respond to this Call for Papers and share your latest work at our biannual celebration of the aeronautical science, innovation and creativity – in the home of some of history's most imaginative minds.



Dimitri Mavris
President



Chris Atkin
Chair Programme Committee

Authors are invited to submit an abstract for a potential paper before 01 January, 2024



Dear Colleagues,

On behalf of the Italian Association of Aeronautics and Astronautics (AIDAA), I am honored to invite professionals from academia and industry and governmental representatives to attend the 34th Congress of the International Council of the Aeronautical Sciences (ICAS).

Since the first ICAS Congress in Madrid in 1958, this has become the world's primary forum for aeronautical technology. The long-lasting success of the ICAS Congress will be confirmed and strengthened in Florence in 2024 due to the participation of leading experts and leaders of top aerospace industries, research centers, universities, and government representatives.

As a founding member of ICAS, AIDAA will be proud to deliver a memorable congress thanks to the support of the Italian aeronautical community it has represented for over 100 years.

ICAS 2024 will be held at Firenze Fiera Conference & Exhibition Center from 9 to 13 September 2024.

I look forward to welcoming you to ICAS 2024 in Firenze.



Erasmo Carrera

President of the Italian Association of Aeronautics and Astronautics

Timeline for Authors

- Upload your abstracts on www.icas.org until 01 January 2024
- Authors receive an answer by 31 March 2024
- Upload your full paper prior to 01 June 2024
- Register to the Congress prior to 15 June 2024
- Please check out www.icas.org/next_events/call_for_papers.php frequently for updates concerning submission/paper handling till the congress.

Congress Programme

The ICAS Programme Committee (PC) will assemble a Congress programme containing approximately thirteen parallel sessions and interactive presentation exhibitions. Student presentations (see page 4) will be embedded in the technical sessions. Based upon the experience of previous Congresses, the final programme is expected to contain more than 500 oral presentations. In addition, there will be a number of high quality, invited lectures on topics of particular importance and general interest in the technical sessions. A number of "General Lectures" on subjects of major importance, delivered by leading experts, will be included in the morning and afternoon plenary sessions.

Congress Proceedings

All papers accepted for presentation (oral, standby and interactive presentations) will be included in the Congress Proceedings online and on a data medium which will be published in the German national library. Please notice that a paper will not be included in the Proceedings if it is not presented at the Congress. ICAS Proceedings are indexed in Scopus database as serial conference proceedings.

Best papers will be proposed for special issues in the following partner journals:

The Aeronautical Journal – Cambridge University Press

Aerotecnica, Missili e Spazio - Springer

Congress venue

The 34th ICAS Congress will be held in Florence, Italy. The host and local organizer is the Italian Association of Aeronautics and Astronautics (A.I.D.A.A.) – the ICAS Member Society in Italy. More information about the venue and the logistic arrangements are given on page 6 and at www.icas2024.com.



International Council of the Aeronautical Sciences

Please submit your abstract online at ICAS website www.icas.org before 1 January 2024.

Authors are invited to pay careful attention to the presentation and content of their abstract. Knowing that there are more candidates than possible presentations, paper selection for the ICAS Congress is based on the quality of the abstract. Some important criteria for the abstract to be selected are scientific/technical content, importance to the field, style/clarity, and completeness. There is no required format, or suggested template, for the abstract.

Abstracts must be written in English. They should be written concisely and they must include a title for the proposed paper and the name and affiliation of the authors. The abstract must be an extended abstract or draft manuscript with a minimum of 1,000 words. The submission should include sufficient detail to demonstrate the purpose of the paper, the technical foundation for the topics to be discussed, any preliminary results to date, and the expected results of the final paper, including key figures, equations, tables, and references, as appropriate. Sufficient information should be included in the submission to convince the ICAS Program Committee that, besides the scientific/technical value of the proposed paper, the author(s) will have a strong likelihood of completing the work by the final manuscript submission deadline.

Your abstract should also include author name, affiliation, complete mailing address, telephone number and email address. Due to limited space, only the first three authors will be shown in the final program. However, all authors should be included in the paper. Moreover, authors should adhere to the good practices in the writing of technical papers, such that only those directly involved with creation of the material should be listed as authors. Please use acknowledgements otherwise.

At the uploading of your abstract, you should indicate if your paper is intended as an oral or as an interactive presentation. Furthermore, it should be indicated if your paper qualifies as a student paper. Please note the details for the student paper submission on the upload-page. When uploading your abstract, you will be requested to also upload a very short summary to be used in the Congress final program. This should contain a maximum of 50 words. Please indicate for which ICAS topic area the proposed paper is intended.



Authors will be informed about the acceptance/rejection of their paper not later than 31 March, 2024. Full papers must be delivered at the latest by 01 June 2024 for inclusion in the Congress proceedings.

Interactive Presentations

Interactive Presentation sessions will be organized for the cases where this mode of presentation is preferred by authors or considered more appropriate by the Programme Committee. There is no limitation in number for interactive papers and they are selected on their merit only.

Student Presentations and Student Awards

Undergraduate or postgraduate students, who will not have completed doctorate studies by the date of the Congress, may submit an abstract on any topic of the Congress. To participate in the McCarthy-Student-Award, students must check the participation request upon uploading their abstract. The two best student papers will be awarded with the ICAS McCarthy Award at the banquet of the ICAS Congress, which also includes a financial stipend and free admissions to the banquet. To be eligible to take part in the competition for the ICAS McCarthy Award, the abstract and subsequent paper is to be authored and presented by students only. The precise rules are listed on the upload-page.

Feedback on the abstracts

The ICAS Programme Committee may provide individual feedback when screening the abstracts. This should enable the submitters of the abstracts to provide a better presentation at the Congress and a paper with a higher quality for the ICAS archive. Furthermore the session chairs may request feedback or preliminary versions of the paper from the authors prior to the final paper submission deadline. Authors are expected to reply promptly and accurately to such requests.

Full paper review

Full papers submitted to ICAS will be reviewed by the Programme Committee and the authors may be contacted with requests to perform modifications and/or improvements to their respective papers.

Contact information

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ICAS 2024 TOPIC AREAS

1. Aircraft Design and Integrated Systems

- Innovations for classical air vehicle configurations (commercial, military, general; fixed wing, rotorcraft, etc) from subsonic to hypersonic speeds
- Integrated designs focussing on top-level system objectives (uninhabited, VTOL, environmentally responsible, survivable, total lifecycle value), especially if addressing multiple, possibly conflicting objectives
- Design for electric or alternative fuel or propulsion concepts
- Unconventional aviation systems and concepts
- Advanced design tools and methodologies (MDO, digital twinning, PLM, etc – see also Manufacturing)

2. Systems Engineering and Integration

- Advances in systems engineering and integration
- Systems of Systems
- Integrated product and process development
- Innovations in engineering management
- Model-based and distributed development
- Industrial Internet of Things

3. Aerodynamics

- New insights into flow physics (all speed regimes; high angle-of-attack; unsteady flow; instability; transition and turbulence; shock waves; plasma and aerothermal effects; etc)
- Aeroacoustics and fluid-structure interaction
- Applied aerodynamics, especially for unconventional concepts
- Control of flow phenomena, loads and noise
- Measurement facilities, techniques and results (wind tunnel, acoustic and flight testing)
- Computational facilities, techniques and results (CFD and analytical approaches applied to representative flow regimes and configurations)
- Biologically inspired flight

4. Materials and Structures

- Properties and applications for novel materials (including those used by additive manufacture)
- Structural mechanics and dynamics, including dynamic/acoustic/impact loading and response
- Test facilities, techniques and results
- High temperature and hostile environments
- Fatigue and damage tolerance
- Smart structures and health monitoring
- Nanotechnology

5. Propulsion and Energy

- Classical propulsors and components (propellers, fans, inlets, nozzles, jets, ramjets, scramjets, etc)
- Propulsion / airframe integration
- Propulsion system acoustics and emissions
- Test facilities, techniques and results
- Electrical and alternative energy sources, propulsion systems and infrastructure

6. Flight Dynamics and Control

- Advances in flight dynamics and handling qualities
- New control techniques and systems
- System and parameter identification
- Flight testing and simulation techniques and results
- Performance and trajectory optimization
- Autonomy and AI-assisted control

7. Systems, Subsystems and Equipment

- Advances in, and optimisation of, classical aircraft systems (electrical, hydraulic, pneumatic; avionics, fuel, power generation and distribution, landing gear; ice, rain and lightning protection; cabin and hygiene; emergency)
- Integration of equipment systems
- Test facilities, techniques and results
- Advanced sensor systems

8. Manufacturing and Supply Chain Management

- Digital manufacturing (CAD/CAM, computer integrated manufacturing, digital twinning, VR/AR, cognitive manufacturing, product lifecycle management and other information system technology)
- Robotics, automation and assistive technologies
- Additive and other low-waste manufacturing
- Supply chain management
- Total quality management
- End-of-life management

9. Air Transport System Efficiency

- Aircraft operation and flight management
- ATM, airspace and airport capacity
- Mitigation of environmental and weather effects
- ATM for mitigating environmental impact
- New concepts for aerial mobility
- Intermodality and required physical/digital infrastructure

10. Safety and Security

- Accident prevention, survivability and crashworthiness
- Human factors
- Airworthiness and certification (see also Operations and Sustainment)
- Aviation medicine
- Physical security, airborne and on ground
- Cyber security during design, manufacture and operation

11. Operations and Sustainment

- Innovations in maintenance, repair, overhaul, logistics and through-life support
- Total lifecycle analysis
- Reliability and maintainability
- Condition-based maintenance, prognostics and big data
- Extreme environmental conditions
- Ageing aircraft: continuing airworthiness; systems and upgrades
- Customer and product support

12. Education and Training

- Design education
- Activities for students: hands-on and project work, including design, build and fly
- Continuing professional development, including digital up-skilling

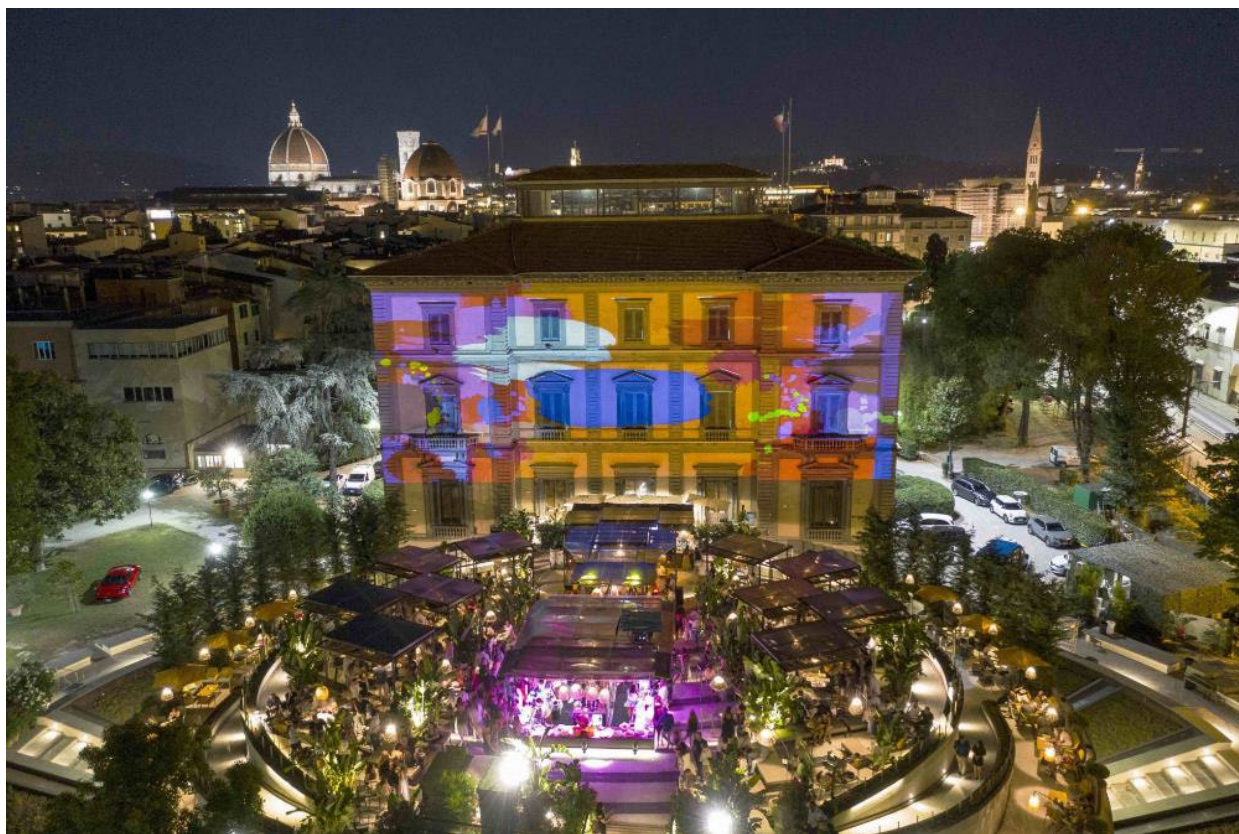
General Information

The 34th ICAS Congress will be held in Florence, Italy. The host and local organizer is the Italian Association of Aeronautics and Astronautics, www.aidaa.it.



Congress Venue

The venue for the ICAS 2024 Congress will be *Firenze Fiera Conference & Exhibition Center*. Located at the heart of Florence, *Firenze Fiera* offers convenient access to the city and is at 5-minute walking distance from the central railway station of Santa Maria Novella and 1 km from the Duomo. Furthermore, *Firenze Fiera* is easily accessible by public transportation, including bus and tramway. Moreover, the Amerigo Vespucci international airport is only 5 km away and accessible by tram. Please, read more about the venue here: <https://www.firenzefiera.it/>.





Florence can be easily reached by plane, train, or car. The city has its international airport (Amerigo Vespucci), Pisa International Airport is just 50 km away, and Bologna International Airport is about 100 km away. Furthermore, the city is a high-speed railway hub with direct trains from/to Roma (90 mins), Milano (90 min), and Napoli (3 hours).

75% of hotels are within walking distance from *Firenze Fiera*, with more than 200 accommodation options available in the city center.

Accompanying Persons Program and Post Congress Tours

Florence is an exciting city with a remarkable history with plenty of Renaissance architectural masterpieces. Tour options will be organized to visit venues like Uffizi, the Vasari Corridor, Boboli Gardens, Cathedral with the Brunelleschi Cupola, and Giotto Tower. In addition, Florence's surroundings offer many other tour options, like Pisa, Siena, Lucca, and the Chianti Valley.

Post-Congress Tours will include cities like Roma, Napoli, Milano, Bologna, and Venezia, being easily reachable by high-speed trains with the possibility to combine them with technical tours.

Technical Tours

Technical tours will be arranged from Friday, the 13th, 2024. Several options will be available and may be combined with post-congress tours. The Leonardo Helicopter Division (former Agusta Westland), a center of excellence for rotary wing platforms development and production, is in Cascina Costa/Vergiate, near Milano. Close to Naples, CIRA (Italian Research Center for Aerospace) hosts the Scirocco Plasma Wind Tunnel, the world's largest and most powerful hypersonic, high enthalpy, low-pressure arc-jet facility for the design of Thermal Protection, Systems, and Payloads of space vehicles during the hypersonic reentry phase.

Leonardo aerostructure division, highly specialized in composite technologies and manufacturing, where primary structural components with high technology content are developed and manufactured in cooperation with the world's leading producers, is in Grottaglie in the Salento region.

For more information about Florence, please, visit www.feelflorence.it/en

Plan to attend ICAS 2024 Congress in Firenze, 9-13 September 2024, and upload your abstract on www.icas.org before 1 January 2024.





The Italian Aeronautics Community Welcomes ICAS2024 in Florence

What is the International Council of the Aeronautical Sciences?

- It was founded by Theodore von Kármán in 1957.
- It is a non-government, not-for-profit organization that facilitates and encourages the free exchange of information on aeronautical research and technology at a global level.
- It is the global organization supporting aeronautical engineering professional societies and associated organizations from around 30 countries.
- It organizes a major biennial Congress presenting timely, high quality work from the world-wide research community covering all aspects of aeronautical science and technology and their application to both military and aviation.
- More than 800 engineers and scientists from all over the world attended the last ICAS Congress in Stockholm, Sweden and about 600 papers were presented.
- All papers presented at the congress are included in the electronic publication available at the Congress. In addition, the ICAS electronic archive, containing over five thousand documents, is freely available to the world-wide aeronautics community.
- The ICAS Congress provides a unique forum for engineers and scientists from all over the world to meet, to hear the results of the latest research and to exchange