33RD CONGRESS OF THE INTERNATIONAL COUNCIL OF THE AERONAUTICAL SCIENCES STOCKHOLM, SWEDEN, 4–9 SEPTEMBER, 2022

ICAS 2022 SWEDEN

After four years, the ICAS community will meet again to discuss Aeronautics Research and Innovation for Future Generations.

CALL FOR PAPERS

Please submit your abstract online at www.icas.org before 10 Feb 2022.

HOSTED BY
THE SWEDISH SOCIETY OF AERONAUTICS AND ASTRONAUTICS (FTF)
IN COOPERATION WITH
THE SWEDISH STRATEGIC INNOVATION PROGRAMME FOR AERONAUTICS (INNOVAIR)

It is with great pleasure that we would like to invite you to the 33rd 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 2022 ICAS Congress will be held in Stockholm, Sweden, from 4 to 9 September 2022. The ICAS Congress is returning to Stockholm after 32 years. Our Swedish colleagues are striving to uphold the ICAS tradition of bringing together a global array of topics and participants as the only true international forum that *covers the world of aeronautics*. The scientific portion of the congress will take place at the Stockholm Waterfront Congress Centre, which is a world-class facility, extremely conveniently located and that affords beautiful views of the Stockholm waterfront.

We would like the 33rd ICAS Congress to be a celebration of the resilience of our industry as we, the global aeronautical community, are finding ways to continue to deliver the systems and the value that our customers expect despite the considerably shrunk market, at least for commercial aviation. We hope that the moment of pause, which was necessarily inflicted upon us by this pandemic, will serve as a way of focusing our objectives, improving the technical quality of our work and reminding us that we are part of a global system that requires cooperation and understanding.

The Congress theme for ICAS 2022 is "Aeronautics Research and Innovation for Future Generations". Presentations at the Congress, from oral paper reports to interactive discussions, cover all aspects of aeronautical science and technology including civil and military aviation applications. Leading engineers, scientists, technologists and managers in aeronautics from around the world will be there to:

- present their work to an informed and truly global audience
- hear the latest developments from internationally recognized experts
- exchange information and opinions with colleagues from around the world
- initiate and further develop collaborative relationships
- build long lasting networks with colleagues in other countries and cultures
- see and understand the implications of technical advances throughout aviation

As it is usual with the ICAS Congress technical program, we are planning to cover the core aeronautical disciplines such as Aircraft Design, Aerodynamics, Propulsion, Materials and Structures, Systems and Subsystems, and Controls. Moreover, as ICAS has been doing for the last congresses, current topics that address emerging technologies that lead to improved performance, a cleaner or quieter environment, or more agile development processes are also planned for the technical program. However, consistent with the unprecedent times that we are living through, the program will also address technical aspects associated with healthier and safer air circulation conditions inside airplanes, airport procedures and other issues that became relevant throughout the current pandemic. Therefore, you should expect the same usual breadth in the technical program as in all ICAS Congresses, but with some special sessions to address Covid-19 consequences to our aeronautical industry. The full list of ICAS 2022 topic areas is attached.

We hope to see you in Stockholm in 2022, we encourage you to submit your work for a technical presentation at the congress and we are looking forward to the opportunity of, once again, welcoming our ICAS friends and colleagues to our biennial gathering of the aeronautical sciences, technology and industry.

Joao Azevedo
President

Dimitri Mavris
Chair Programme Committee

Authors are invited to provide an abstract for a potential paper before 10.02.2022

Timeline for Authors

- Upload your abstracts on www.icas.org until 10 February 2022
- Authors receive an answer by 31 March 2022
- Upload your full paper prior to 01 June 2022
- Register to the Congress prior to 15 June 2022
- 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 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 a national library. Please notice that a paper will not be included in the Proceedings when it is not presented at the Congress. The proceedings for the last six ICAS Congresses were indexed on Scopus.

Congress venue

The 33rd ICAS Congress will be held in Stockholm, Sweden. The host and local organizer is the Swedish Society of Aeronautics and Astronautics (FTF) – the ICAS Member Society in Sweden, together with Innovair – The Swedish Strategic Innovation Programme for Aeronautics. More information about the venue and the logistic arrangements are given on page 7 and on www.icas2022.com.

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.
- 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 ideas and information. It also provides an opportunity for young engineers and students to develop an international network of colleagues.

International Council of the Aeronautical Sciences

Please submit your abstract online at ICAS website www.icas.org before 10 February 2022.

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 should 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 must 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 must 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 and fax numbers, and email address. Due to limited space, only the first three authors will be shown in the printed 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 is intended as a student paper. When uploading your abstract, you will be requested to also upload a very short version, of about 50 words, to be used in the Congress final program. Please indicate for which ICAS topic area the proposed paper is intended.

Abstract review by Member Societies
The abstracts will be made available to the national Member Societies by the ICAS Secretariat for screening and evaluation and the Member Societies will be asked to submit their recommendations ("not supported, supported, strongly supported") to the ICAS Programme Committee for final evaluation and selection. NOTE: If there is no national ICAS Member Society in the country, the abstracts will be evaluated only by the ICAS Programme Committee.

Authors will be informed about the acceptance/rejection of their paper not later than 31 March 2022. Full papers must be delivered at the latest by 01 June 2022 for inclusion in the Congress proceedings. Moreover authors will have to contact their session chair prior to the above deadline in order to align, ensure the paper is coming along adequately and that it also satisfies the ICAS standards in terms of quality and content.

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, in principle, no limitation in number for interactive papers and they are selected on their merit only.

Student Presentations
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 full paper. Students must ensure before accepting selection in April 2022 that they can cover their travel and hotel expenses. The two best student papers will be awarded with the ICAS McCarthy Award, which also includes a financial stipend. 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.

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, as stated above, 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.

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ICAS 2022 TOPIC AREAS

1. **Aircraft Design and Integrated Systems**
   - Commercial Transport Aircraft
   - Military Aircraft and Missiles
   - Non-conventional Aviation Systems and Concepts
   - Unmanned Air Vehicles
   - Supersonic and Hypersonic Aircraft
   - Rotorcraft
   - Sailplanes and Ultralight Aircraft
   - Multi-Disciplinary Optimization
   - Design for Survivability
   - Design Education
   - Life Cycle Value
   - Hybrid/Electric and Unconventional Fuel Aircraft
   - Personal / Urban Air Mobility
   - Environmentally Responsible Aircraft

2. **Systems Engineering and Integration**
   - Systems Engineering
   - Systems Integration
   - System of Systems
   - Engineering Management
   - Distributed Development
   - Model Based Development
   - Integrated Product and Process Development
   - Design Methodology
   - Industrial Internet of Things

3. **Aerodynamics**
   - Subsonic
   - Transonic and Supersonic
   - Hypersonic Aerothermodynamics
   - High Angle of Attack, High Lift
   - Computational Fluid Dynamics
   - Aerodynamics of Unconventional Aircraft
   - Flow Stability, Transition and Turbulence
   - Wind Tunnel and Flight Testing
   - Experimental Facilities and Techniques
   - Aeroacoustics and Reduction of Noise
   - Flow Control
   - Biologically-inspired Flight

4. **Materials and Structures**
   - Composite Materials and Structures
   - Applications and Issues
   - Metallic Alloys
   - High Temperature Materials and Structures
   - Structural Mechanics
   - Fatigue and Damage Tolerance
   - Structural Dynamics and Aeroelasticity
   - Dynamic Loading, Acoustic Loading and Impact
   - Structural Testing
   - Nanotechnology

5. **Propulsion and Energy**
   - Propellers and Fans
   - Hypersonic Propulsion
   - Inlets and Nozzles
   - Propulsion / Airframe Integration
   - Noise and Emissions
   - Experimental Facilities and Techniques
   - Electric Propulsion
   - Alternative Fuels

6. **Flight Dynamics and Control**
   - Flight Dynamics
   - Control Techniques and Systems
   - Aircraft Handling Qualities
   - Flight Testing and Simulation
   - Performance and Trajectory Optimization
   - Missile Guidance
   - Autonomous Operations
   - Neural Networks
   - System and Parameter Identification

7. **Systems, Subsystems and Equipment**
   - Integration of Equipment Systems
   - Power Optimised Aircraft Systems
   - Electrical, Hydraulic and Pneumatic Systems
   - Avionic Systems
   - Landing Gear and Braking Systems
   - Auxiliary and Emergency Power Generation
   - Aircraft Fuel Systems
   - Lightning, Cabin and Water/Waste
   - Ice and Rain Protection
   - Advanced Sensor Systems
   - Emergency Systems
   - Aircraft Systems Testing

8. **Manufacturing and Supply Chain Management**
   - Supply Chain Management
   - CAD/CAM and Computer Integrated Manufacturing
   - Information System Technology / 3D Printing
   - Robotics
   - Automated and Assistive Technologies
   - Cognitive Manufacturing
   - Total Quality Management

9. **Air Transport System Efficiency**
   - Aircraft Operation
   - Flight Management
   - ATM and Airspace Capacity
   - Weather Effects
   - Airport Capacity
   - Intermodality Issues

10. **Safety and Security**
    - Accident Prevention
    - Accident Survivability, Crashworthiness
    - Human Factors
    - Airworthiness and Certification
    - Ageing Aircraft
    - Aviation Medicine
    - Airborne Aircraft Security
    - Airport Security
    - Cyber Security

11. **Operations and Sustainment**
    - Maintenance, Repair and Overhaul
    - Reliability and Maintainability
    - Condition Based Maintenance
    - Logistics and Through-life Support
    - Extreme Environmental Conditions
    - Continuing Airworthiness
    - Ageing Systems and Upgrade
    - Total Lifecycle Analysis
    - Customer and Product Support
    - Prognostics and Big Data

12. **Education and Training**
    - Student Design, Build and Fly Activities
    - Aeronautical Student Projects
    - Student Hands-on Activities
    - Continuing Professional Development

ICAS 2022 - Stockholm, Sweden

General Information

The 33rd ICAS Congress will be held in Stockholm, Sweden. The host and local organizer is the Swedish Society of Aeronautics and Astronautics (FTF) together with Innovair – The Swedish Strategic Innovation Programme for Aeronautics.

Congress Venue

The venue for the ICAS 2022 congress will be **Stockholm Waterfront Congress Centre**. Located at the very heart of Stockholm, the venue offers convenient access to all that Stockholm has to offer. **The congress centre is only an escalator away from the Central Station**, the arrival point for intercity trains, buses, subway links and the Arlanda Express airport shuttle. The three-story building offers **stunning views** of the City Hall and the surrounding waters. The Radisson Blu Waterfront Hotel is adjacent to the Congress Centre and Central Station. Several other hotels are located within a few minutes' walk. Make a video tour around the Stockholm Waterfront Congress Centre and read more about the venue at: **www.stockholmwaterfront.com**.

Accompanying Persons Programme

Stockholm with surroundings has a lot to offer visitors. Magnificent art, dynamic culture, ornate palaces, medieval history and unspoilt nature. Some accompanying persons may wish to visit attractions on their own but different organized tours will be offered on Monday through Thursday. Read more here.

Technical Tours

Technical tours will be arranged on Friday September 9th. One tour will be to Saab in Linköping, well known for the development of many generations of military aircraft as well as it's commuter aircraft Saab 340 and Saab 2000. This tour will also include a visit to the Air Force Museum. Another tour will be to GKN Aerospace Engine Systems in Trollhättan, where components for aircraft, gas turbines and rocket engines with high technology content are developed and manufactured in cooperation with the world's leading producers. A half-day tour will be to the Remote Tower Centre at Stockholm Arlanda airport, from which a number of Swedish airports are remotely controlled. Read more about the **technical tours** and about aeronautics in Sweden on the congress website.

For further information please check the websites below or contact:

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Photo: H. Trygg/Visit Stockholm

For more information about Stockholm please download the Stockholm official guide.

Plan to attend ICAS 2022 Congress in Stockholm, Sweden 4-9 September 2022 and upload your abstract on www.icas.org before 10 February 2022.

Photo: J. Wikström/Visit Stockholm (below and front page)