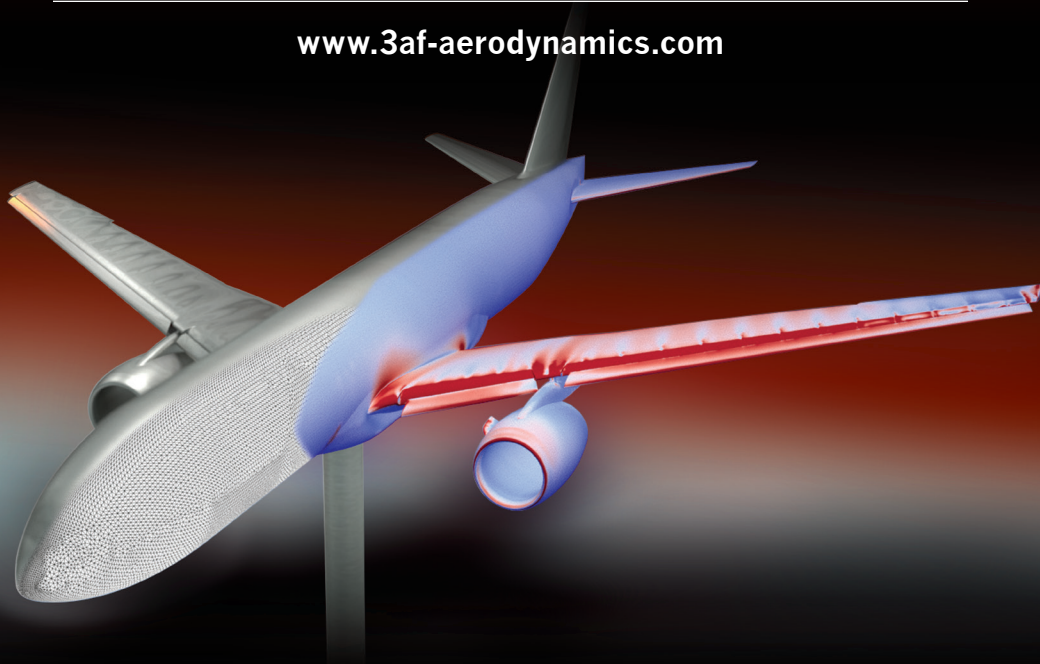


CALL FOR PAPERS

**58<sup>th</sup> 3AF International Conference  
on Applied Aerodynamics**  
**Emerging approaches  
in aerodynamics**  
Orléans, France – March 27-28-29, 2024

[www.3af-aerodynamics.com](http://www.3af-aerodynamics.com)



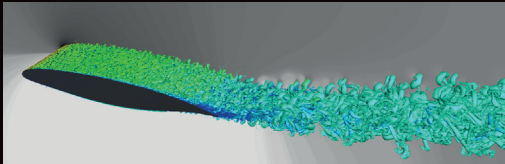
Skin friction visualisation - Wind Tunnel and Digital Twin. Credit ONERA

# CALL FOR PAPERS

Communication abstracts (300 to 500 words, preferably with figures) have to be mailed to the 3AF Executive Secretary (aero.conf@3af.fr) before **December 01, 2023**.

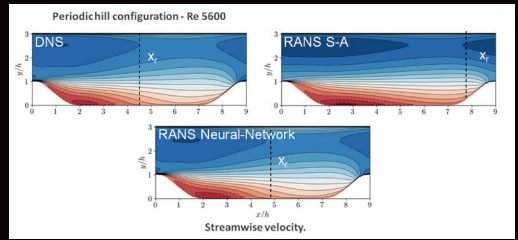
The Scientific Committee will inform the authors of acceptance by **December 11, 2023** at the latest.

## OFFICIAL LANGUAGE & PUBLICATIONS



Innovative Detached Eddy Simulation in low subsonic. Credit IMFT-ICUBE

Authors of the most instructive contributions will be invited to submit an extension of their works for possible publication in a special issue of the International Journal of Numerical Methods for Heat & Fluid Flow (IJNMHFF, Emerald, IF2021: 5.181). This special issue dedicated to the theme “Emerging Approaches in Aerodynamics” does not constitute the proceedings of the conference. Each submitted paper is reviewed by Prof. Bairi, Guest-Editor-in-Chief and Advisory Editor of the IJNMHFF journal. If the article is judged suitable for publication, it will be sent to at least two independent referees for peer review with the rigorous expertise process of the IJNMHFF journal. Authors are however free to publish their paper in any other journal, a reference to the conference being then appreciated.

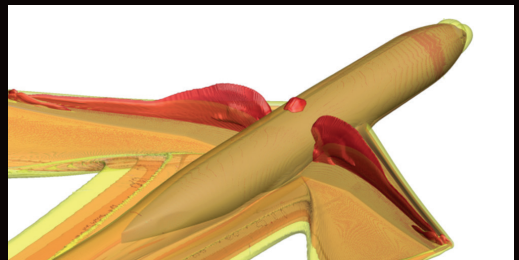


Machine learning-augmented turbulence modelling - Credit ONERA

Papers must be submitted and presented in English. The written version of the communications will be in English and must be sent to the 3AF Executive Secretary (aero.conf@3af.fr) before **March 04, 2024**, to allow their insertion in the conference proceedings. A 3AF template file will be provided for the preparation of the manuscript.

## CONFERENCE DEADLINES

Abstract submission: **December 01, 2023**  
Paper acceptance: **December 11, 2023**  
Full length paper: **March 04, 2024**  
Conference in Orléans: **March 27-28-29, 2024**



Isosurfaces of Anergy generation around the NASA-CRM. Credit ONERA

## CONFERENCE SECRETARIAT COORDINATES

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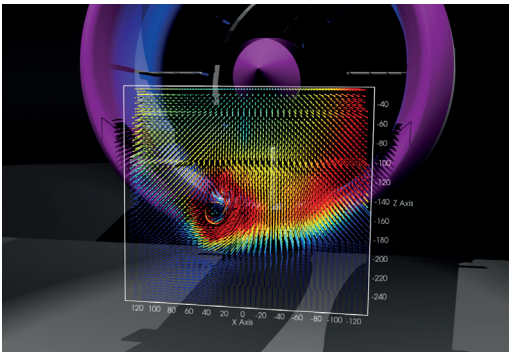
**3AF**  
Association Aéronautique  
et Astronautique de France

# EMERGING APPROACHES IN AERODYNAMICS

The 3AF International Conference on Applied Aerodynamics focuses each year on a different topic representative of current concerns in the field of aerodynamics. It is organized around five sessions, each of which is introduced by a keynote speaker in the field covered by the session. **In 2024, the conference will focus on emerging approaches in aerodynamics**, taking advantage of massive data being collected from high-fidelity numerical simulations, highly instrumented wind-tunnel testing and innovative flight tests measurements.

*The conference will cover both external and internal aerodynamics. The experimental, theoretical and numerical aspects, ranging from fundamental research to industrial applications will be addressed. This conference will consider problems encountered in the aerospace domain (both military and civilian) and in the transportation domain including electric air taxis and in energy production, such as wind turbines for instance.*

*This 58th Edition, hosted by the Department Fluid, Energy, Combustion, Propulsion (FECP) at the PRISME Laboratory of Orléans University, intends to gather experts in diverse fields to share their perspectives on Emerging Approaches in Aerodynamics.*



Stereo-PIV of a ground vortex in Jules Verne wind-tunnel.  
Credit CSTB, Safran & Capgemini – INVIGO Project

## KEYNOTE SPEAKERS

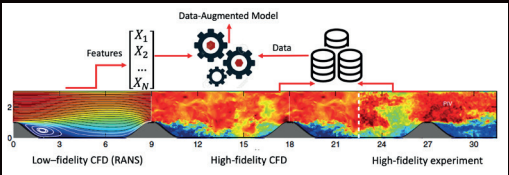
Xavier <b>BERTRAND</b>	Airbus Commercial Aircraft
Paola <b>CINNELLA</b>	Sorbonne University
Laurent <b>CORDIER</b>	CNRS – P <sup>+</sup> Institute
Gianluca <b>IACCARINO</b>	Stanford University
Olivier <b>MARQUET</b>	ONERA

## MAIN TOPICS

The emerging methods: big data, machine learning, artificial intelligence, high-fidelity simulations, provide enhanced capabilities to major models. Data-driven turbulence modelling, disruptive geometry modelling techniques, self-adaptive meshing are among the models that benefit from these techniques. Generative modelling allows aerodynamic data fusion from multiple sources providing a more complete coverage of flight envelope. Physics-aware surrogate models combined with high-order simulation improve interdisciplinary predictions and multidisciplinary design optimization, essential for next generation of environmentally friendly products.

The following items will be considered to address the above challenges (the list not being exhaustive):

- **Data-driven aerodynamic models** through data science and machine learning
- **Impact of machine learning** on aerodynamic design optimization
- **Aerodynamic design assisted** by reduced-order modelling and machine learning.
- **Machine Learning** for Turbulence Modelling.
- **Unsteady aerodynamics** of e.g. eVTOL, unducted rotors, wind turbines...
- **Innovative tools** for numerical simulation: RANS, LES, LBM
- **Innovative mesh** Generation of complex geometry
- **Self-adaptive mesh** techniques
- **Multidisciplinary Design Optimization**
- **Multiphysics interactions:** aeroacoustics, aeroelasticity, heat and mass transfer
- **Data assimilation**, Digital twins
- Processing of large amount of data from various data sources including **numerical simulations, wind tunnel experiments or flight tests**
- **New measurement** techniques
- **Innovative** Post-processing of experimental measurements
- **Real-time flight** measurements
- **In-flight identification** of aerodynamic performance



Data-Augmented turbulence modelling. Credit Sorbonne University & ENSAM

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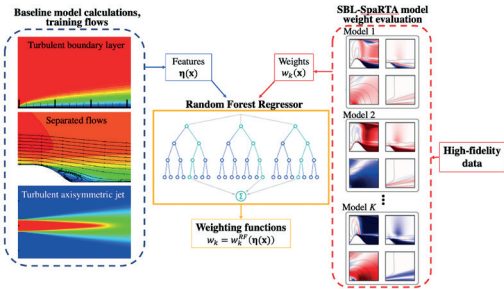
Dassault Aviation

ONERA

Boeing Commercial Airplane (retired)

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Members of the 3AF Aerodynamics Technical Committee



Space-dependent turbulence model aggregation using machine learning. Credit Sorbonne University & ENSAM



CONFERENCE LOCATION

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45072 Orléans  
[www.univ-orleans.fr/polytech](http://www.univ-orleans.fr/polytech)

