CFD Vision 2030 – cfd2030.com

AIAA Aviation 2025 Call for Papers
Abstract due date: Nov 21, 2024

The CFD 2030 Vision report laid out a bold vision for future computational capabilities and their potential impact on aerospace engineering and design, and recommended the establishment of Grand Challenges (GCs) in four areas: Large Eddy Simulation (LES) of a powered aircraft configuration across the full flight envelope, off-design turbofan engine transient simulation, Multi-Disciplinary Analysis and Optimization (MDAO) of a highly-flexible advanced aircraft configuration, and probabilistic analysis of a powered space access configuration. Since 2021, four GCs have been developed and published in key technical areas: high-lift aerodynamics (AIAA Paper 2021-0955), full engine simulation (2021-0956), CFD-in-the-loop for space vehicle design (2021-0957), and hypersonics (2024-0683). Under the CFD2030 topic, we are soliciting papers that address current efforts to advance CFD technology, to both highlight the current state-of-the-art and to help identify where technology advancements are needed to make significant progress towards achieving the GCs, in the following areas:

- ***Advances in Uncertainty Quantification (UQ) with applications in Certification by Analysis***
- ***AI and Machine Learning applications for improved predictive CFD and multidisciplinary simulations***
- ***CFD algorithms and techniques for Quantum Computers***
- ***CFD technology to predict aerodynamic characteristics at the edges of the flight envelope***
- ***Integrating High Fidelity CFD Simulations and Data into the Digital Thread***
- ***Propulsion related simulations toward Full Engine Simulation and Propulsion-Airframe Interaction***

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